

DR. J. HALL MOORE



General Considerations of Porcelain.*

By DR. JOHN Q. BYRAM, Indianapolis, Ind.

In order to understand better the properties of porcelain, it is necessary to consider the ingredients of which it is composed. Such a consideration shows porcelain to be made up of three classes of substances. First, the basal ingredients, which are very refractory; sillex and kaolin, which when heated alone, will undergo intense heat with practically no change; and feldspar, a less refractory substance, which when heated to a high degree undergoes liquifaction. Second, fusible substances known as fluxes, which fuse at a lower temperature and increase the fusibility of the more refractory substances; and, third, metals or their oxids used as pigments.

Sillex. Sillex (Si O_2) is the oxid of silicon, and is an infusible substance insoluble in all acids except hydrofluoric, but slightly soluble in caustic alkalis.

It forms about 13.5 per cent. of the basal mass. It adds strength and firmness to the porcelain and gives it a more translucent appearance.

Kaolin. Kaolin ($2\text{Al}_2 \text{ O}_3 \text{ Si O}_2 3\text{H}_2 \text{ O}$) is the silicate of aluminum and is composed of aluminum oxid, silicon oxid and water. It is commonly spoken of

as disintegrated feldspar. Through the natural process of decomposition feldspar loses its potassium oxid ($\text{K}_2 \text{ O}$) by the action of water

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and other agents Kaolin forms about 4.5 per cent. of porcelain. It is a very refractory clay when heated alone, but readily unites with feldspar when mixed with it. When added to porcelain it gives stability of form, which property permits unfused porcelain to be molded and carved.

Feldspar. Feldspar ($\text{Al}_2 \text{O}_3 \text{ K}_2 \text{O } 6\text{Si O}_2$) is the double silicate of aluminum and potassium. It is composed of aluminum oxid, potassium oxid and silicon oxid. The chemical difference between feldspar and kaolin is that feldspar contains potassium oxid, which kaolin does not, and kaolin contains water of crystalization, which feldspar does not. It composes about 82 per cent. of the basal mass of porcelain and adds translucency to it. While feldspar is more fusible than either silicon or kaolin, it requires more heat than can be produced in the electric furnace to fuse some grades of it.

Fluxes. The materials commonly used as fluxes, to increase the fusibility of porcelain, are substances containing sodium borate ($\text{Na}_2 \text{B}_4 \text{O}_7$), sodium carbonate ($\text{Na}_2 \text{CO}_3$), potassium carbonate ($\text{K}_2 \text{CO}_3$), or glass (which contains the oxids of potassium or sodium). The more refractory ingredients, the flux and the frit are ground together in the preparation of the porcelain for the market. Then, when fused, a chemical change takes place, forming an indefinite compound, from which none of the original ingredients can be removed except by some process which involves the destruction of other ingredients.

Pigments. The pigments most commonly used in the manufacture of dental porcelains are precipitated gold, platinum, purple of Cassius (the oxid of gold and tin), the oxids of gold, titanium, manganese, cobalt, iron, uranium and silver. The colors produced by the use of these pigments in varying proportions are hues of red, yellow, blue, green, brown, and gray.

Dental Porcelain. The basal ingredients of porcelain are used in the formulæ for low fusing porcelains, but the fusibility is regulated by the proportion of flux added to the formula. The process of fusing and grinding is continued until the ingredients are thoroughly mixed. Both high and low fusing porcelains may contain a small proportion of starch in their formulæ, which imparts additional stability of form by agglutinating the particles of the mass during the process of molding and carving. It is not, however, a component ingredient of the porcelain, for the heat required to fuse the porcelain will volatilize the starch.

Dental porcelain is divided into high fusing and low fusing porce-

lain. The distinction has been accepted by the profession to mean that a high fusing porcelain is one which fuses above the melting point of pure gold, while a low fusing porcelain fuses at a temperature below this point. Such a distinction is relative rather than accurate, because porcelain has no definite fusing point. Any enamel body or foundation body can be fused on pure gold, provided enough time is given. Some low fusing porcelain will fuse above the fusing point of pure gold, provided the requisite heat to fuse the gold is obtained rapidly. While the above distinction seems to meet all practical requirements, it is unscientific and its only value is to make a convenient distinction between the two classes of porcelain for practical usage.

Because porcelain is an indefinite compound and has no definite fusing point, the following distinction is made between high and low fusing porcelain. High fusing porcelains require more than five minutes to fuse, while low fusing porcelains require less than five minutes to fuse at 2,000 degrees F. It is impossible to fuse any of the high fusing porcelains at 2,000 degrees F. in five minutes, and it is also impossible to keep any of the low fusing porcelains in contact with a heat of 2,000 degrees F. for five minutes without becoming over fused. Porcelains are divided into basal bodies, foundation bodies, enamel bodies and glazes. All basal and foundation bodies are high fusing porcelains, while enamel bodies and glazes may be either high or low fusing porcelain.

Basal bodies are used in crown and bridge-work and for the construction of hand carved teeth, but there is no necessity for using them in inlay work. The use of basal bodies requires a specially constructed furnace for obtaining and maintaining the intense heat needed to fuse them. The present types of electric furnaces may be used, but they can not be depended upon to furnish enough heat to fuse large masses of basal body unless new muffles are procured oftener than most dentists care to buy them, because the intense heat causes the fire clay readily to affect the platinum wire of the muffle. But the foundation and enamel bodies will meet the requirements for inlay work, and the operator should learn the characteristic properties of each of these two classes of porcelain.

While all the porcelains have properties in common, there are, however, certain properties which characterize each manufacturer's product. It is important that these characteristics should be thoroughly understood in order to obtain the best results. With all porcelains the general principles of manipulation are the same. All may be mixed with alcohol, but this mixture is not adapted to molding and carving. Likewise all porcelains may be mixed with water, which insures the possibility of molding and carving.

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Laboratory experiments with the various porcelains will prove of great value both to the student and the practitioner. If the characteristic properties of the different porcelains are understood, the selection of the material to meet individual requirements will be simplified and the operator will be relieved of much uneasiness.

Phenomena Met in Fusing Porcelain.

In a series of experiments carried on for the purpose of studying some of the phenomena of the fusing of the various porcelains, cubes of porcelain 5 mm. on each face, weighing approximately 2.5 grains when thoroughly dried, were taken for a standard (Fig. 1). The first experiments were to determine the fusibility of the different porcelains. As porcelains are indefinite compounds, they have no definite

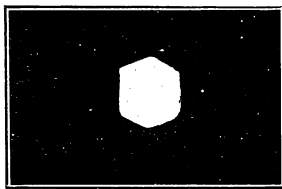


FIG. 1.

fusing point. Porcelains which ordinarily vitrify from 2,080 to 2,500 degrees can be fused on pure gold by allowing long enough time. The experiments showed that Brewster's enamel body can be properly fused on pure gold in from fifteen to forty-five minutes. The difference in time depends upon the heat applied. Close's body (Justi's) requires from thirty minutes to one hour and fifteen minutes to fuse properly on pure gold. Brewster's foundation body, S. S. White's inlay and Whiteley's inlay porcelains require from one to three hours to fuse on pure gold. The Consolidated Company's high fusing porcelain requires from eight to ten hours to fuse on the same material.

It was found that Brewster's foundation body, Close's body (Justi's), S. S. White's and Whiteley's inlay porcelains could be fused on 10 per cent. platinous gold, which fuses approximately at 2,115 degrees, in from fifteen to thirty minutes. Tests were also made with these porcelains on 15 per cent. platinous gold, which fuses approximately at 2,175 degrees. It then required from ten to twenty minutes to fuse Brewster's foundation body, S. S. White's and Whiteley's inlay porcelains.

In studying fused porcelain under the microscope, it was observed that those porcelains which were fused at a lower temperature for a long time, presented more homogeneous and more highly glazed surfaces,

while the surfaces of porcelains which were fused at a high temperature for a short time appeared more granular. The cubes were then fractured and the inner portion examined under the microscope. It was invariably found that those porcelains which were fused for a long time at a lower temperature were more homogeneous in texture.

The next series of experiments were made to determine the relative porosity of underfused and overfused porcelain. In studying the surfaces of the cubes of both high and low fusing porcelains under the microscope, it was found that the surfaces of overfused porcelain were covered with little blisters. Underfused porcelain appeared granular and less dense, while properly fused porcelain presented a denser surface, free from blisters.

The next experiments were to determine the effect of repeated contact of porcelain with the maximum heat required to fuse it. A cube of porcelain was fused at a definite degree of heat. A second cube was then placed beside the first and both heated to the same degree of heat. Then a third cube was placed beside the two and the three heated to the heat required to fuse them. This process was continued until the fifth cube had been fused. The first, second and third cubes were slightly overfused and lighter in color, while the fourth was only slightly lighter in color.

The next experiment was to test the effect of repeated heating of porcelain to the point of biscuiting. This showed that any of the porcelains would finally become fused and maintain their characteristic color.

It is a significant fact that underfused porcelain has a much duller color and is more opaque, while overfused porcelain becomes lighter and tends to become more transparent. If porcelain remains in contact with the maximum heat long enough, it fuses into a glass-like mass. All the shades of a color from a normal to a light may be obtained by increasing the heat above the maximum fusing point of the porcelain, but this is done at a sacrifice of its strength.

It is also a fact that porcelain can be fused, then ground and re-fused at a lower temperature than the first fusing. And if this process of re-fusing and regrinding be repeated a number of times, a high fusing porcelain becomes low fusing. It was also found that the re-fusing and grinding of the porcelain changed its properties.

The following deductions are made from these experiments:

**Deductions
from Experiments.**

1. Porcelain has no definite fusing point.
2. By prolonging the time of exposure to heat, a thoroughly fused porcelain may be obtained at a comparatively low temperature.

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3. Porcelains fused at a lower temperature for a long time will maintain their characteristic color, and will be more homogeneous in texture.

4. Low fusing porcelains can be made of high fusing porcelains by repeated fusing and grinding.

5. If a piece of porcelain is thoroughly fused and more porcelain added and fused, the first layer will be slightly overfused. In the process of applying porcelain in layers and fusing each layer, the underlying layers will be slightly overfused and somewhat lighter in color.

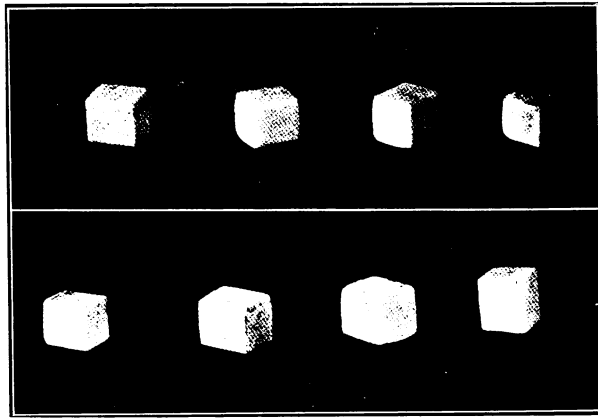


FIG 2.

6. A small mass of porcelain is more readily affected by heat than a larger one, and as the size of the mass of porcelain increases just in that ratio does the length of time required to fuse it increase.

7. Porcelains containing a large percentage of flux are more easily affected by bubbles than those that are more nearly composed of the basal ingredients.

8. It is more difficult to maintain the characteristic color of low fusing than high fusing porcelains when held for a long time at the maximum heat required to fuse them.

9. Low fusing porcelains are denser, have greater shrinkage and less tensile strength than high fusing porcelains.

10. By repeatedly heating porcelain to the point of high biscuiting, it will finally become fused and maintain its characteristic color.

11. High fusing porcelains shrink from 15 to 25 per cent., while low fusing porcelains shrink from 20 to 35 per cent.

12. A coarsely ground porcelain fuses at a higher temperature and shrinks less than one of the same formula finely ground.

13. The amount of shrinkage of any porcelain will in a measure be dependent upon the consistency to which it is mixed, and the density to which it is condensed. The thin mixtures show more shrinkage than those of a putty-like consistency.

14. Underfused porcelain has a much duller hue and is more opaque, while overfused porcelain becomes lighter and tends to become more transparent. All the shades of a color from dark to a light may be

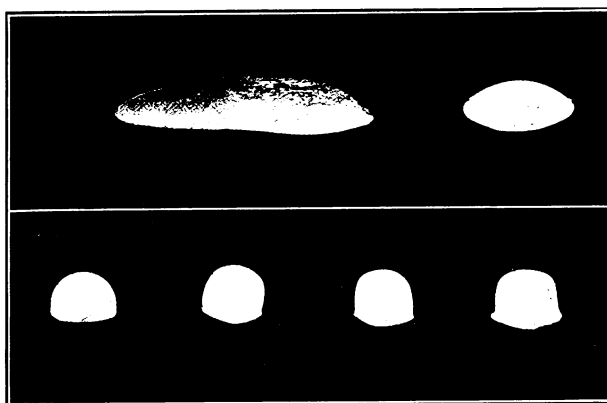


FIG. 3.

obtained by increasing the heat above the maximum fusing point of the porcelain, but this is done at the sacrifice of its strength.

15. The tendency of both high and low fusing porcelains is to assume spheroidal form when overfused, and if considerably overfused they tend to form an amorphous mass of glass.

Figure 2 shows four cubes of low fusing and four cubes of high fusing porcelain each heated separately to the state of hard biscuit. Figure 3 shows the effect on the form of the mass by overfusing porcelain. All of these cubes were fused at the same time and heated to a degree of heat sufficient to overfuse the foundation bodies.

The first three cubes ran together into an amorphous glass-like mass, while the fourth cube formed an amorphous mass to itself. The fifth cube, which was an enamel body, changed to an irregular spheroidal form and the last three cubes became rounded at the edges.

The process of fusing porcelain is largely a chemical reaction,

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brought about by the various ingredients combining to form multiple silicates of aluminum, potassium or sodium with the liberation of gases.

The method of fusing porcelain at its maximum temperature for a short time is to be condemned. It makes the porcelain more brittle and causes the formation of minute bubbles throughout the entire mass, for the intense heat required to fuse the porcelain in a short time may cause the generation of gas faster than it can escape.

The pioneers of dentistry who began the development of dental porcelain were more skillful in its manipulation than most of us at the present time. They were required to grind their materials, solve their formulæ and compound their ingredients. They were also required to carve gum section blocks and other special forms of teeth, and thus developed an art that is almost lost to the dental profession to-day. The technique of performing experimental operations with porcelain develops the operator's skill in its manipulation and thus assists him in performing his practical operations. Experimental work in the laboratory is not a waste of time, but helps one to become more familiar with the subject. The difficulty with many beginners is their unwillingness to devote that time to experimental work which is required to obtain a thorough knowledge of the properties of porcelain and the general principles of manipulating it.

The Common Causes of Nasal and Naso-Pharyngeal Obstruction: Their Symptoms, and Relation to Orthodontia.

By FRANCIS ASHLEY FAUGHT, M.D., D.D.S., Philadelphia, Pa.

Assistant to the Professor of Clinical Medicine, Medico-Chirurgical Hospital and College, Attending Physician to the Lincoln Day-Nursery, etc.

Much uncertainty exists in the average mind in the dental profession concerning the symptoms, diagnosis, and location of the common obstructions found in the upper respiratory tract. This fact has been repeatedly brought to my notice at society meetings, in conversation, and by reading the reports of the proceedings of societies as they appear in the journals from time to time. This view has been further strengthened by questioning my friends and acquaintances in the dental profession.

That such a lack of definite knowledge is lamentable can not be denied, and that it is a decided hindrance to the performance of the highest service, particularly in the case of children, and in the correction of dental irregularity, is, I think, evident. How can any one who is

unfamiliar with the fundamental facts of these conditions, attempt to understand the secondary disturbances and the causal relationship existing between them and oral deformity, and not realizing this relation himself, how can the dental advisor intelligently explain this relation to parents, show their presence and bearing in a given case or argue forcefully for their treatment or removal?

In this age of specialization, where dentistry, a specialty of medicine, possesses within its limits the sub-specialty of orthodontia, it is highly important that this deficiency should be recognized and filled in, possibly by giving the subject of diseases of the upper respiratory tract a position

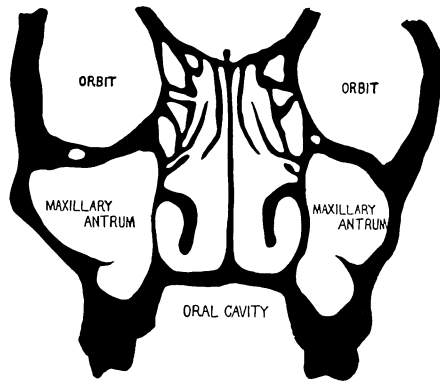


FIG. 1.

in the curriculum of dental schools, and by including it in the text-books used by dental students.

The obstructive lesions which will be considered in this brief paper are the following: adenoids; hyperplastic rhinitis; hypertrophy of the posterior extremity of the inferior turbinate; deflected septum; nasal polypus and hypertrophied tonsils.

Adenoids.

The most common as well as the most important of these conditions is the so-called adenoid disease (Fig. 2). This is the result of a lymphatic hypertrophy of the tissues lining the pharyngeal vault. The disease is essentially one of childhood, rarely extending beyond puberty as a disease *per se*, but frequently leaving in its train pathologic changes which exist throughout the life of the individual. These secondary changes include, diminution in hearing through disturbances in the middle ear, chronic rhinitis, deformities of the chest, the face and of the *dental arches*.

Examination of the naso-pharynx with the rhinoscopic mirror in the presence of adenoids reveals irregular prominences in the posterior wall

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and vault of the pharynx, causing more or less stenosis of the posterior nares. To the palpating finger this mass gives the characteristic "bunch of earth worms" feel. As age advances these become firmer and more resisting through an increase in fibrous tissue, and later become considerably smaller, though they rarely if ever totally disappear.

Children suffering from this disease present a characteristic blank facial expression, and a peculiar dead quality of voice.

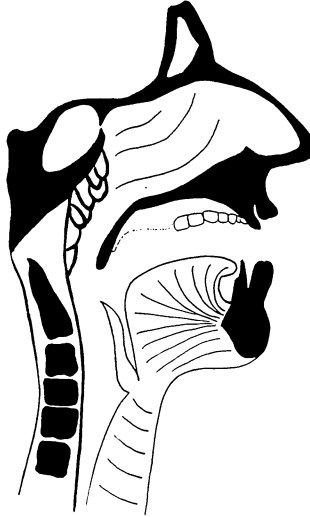


FIG 2.

By questioning the parent we can usually develop a history of more or less disturbed nasal respiration, producing noisy breathing or snoring at night. There is always some catarrhal discharge, usually with cough, becoming worse in damp weather. The child is very subject to colds, and is prone to develop attacks of croup and bronchitis on the slightest provocation. Deafness in slight degree is an early and frequent complication, causing apparent inattention, backwardness, and disobedience on the part of the child.

Existence of any one or a combination of the above symptoms should at once arouse suspicion, which should immediately call for a thorough examination of the upper respiratory tract.

Intra-Nasal Obstruction.

Interference with proper nasal respiration through the presence of intra-nasal obstruction, while less common, in children, than adenoids, must not be forgotten, and in the demonstrated absence of ade-

noids should be carefully sought. Such obstructions produce symptoms very similar to those occurring in adenoids, from which they can not be differentiated except by direct examination.

These intra-nasal obstructions may be due to a general hyperplasia of the mucous lining of the nose (Fig. 3), causing marked diminution in the respiratory capacity of that organ. In other cases it may be confined chiefly to the mucous lining of some of the accessory cavities of

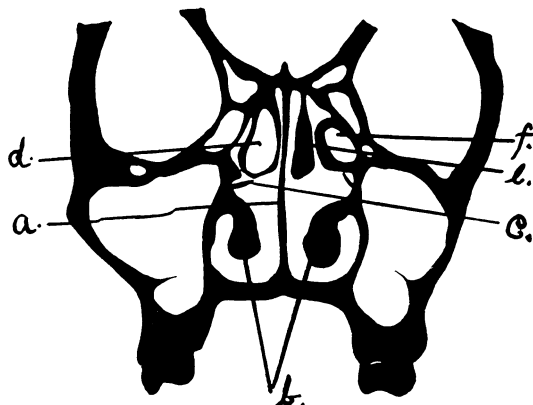


FIG. 3.

the nose, particularly the ethmoid cells (Fig. 3 f), in which case the obstruction will be found in the region of the middle turbinate.

In another class of cases the inferior turbinate in its posterior part presents the chief obstruction (Fig. 4). Differing from the three preceding, involving the region of the middle turbinate and in rare instances the nasal septum at this point, is polypoid degeneration (polypus), (Fig. 5). This is generally looked upon as a disease of middle and later life, but as numerous cases have been reported in young children this paper would be incomplete without reference to it.

The Septum.

Regarding the septum, Cryer and others have shown that a perfectly plain and vertical septum (Fig. 1 a) is practically an anatomic impossibility. We must therefore in the examination of the intra-nasal region be satisfied with what we believe to be a physiologically perfect one. One which as far as functional capacity and the absence of secondary disturbances and symptoms are concerned, is all that can be desired.

Various classifications have been offered to cover all degrees of irregularity of the septum from a simple curvature in either the vertical

or horizontal plane to the extremes of irregularity and crumpling which may follow crushing traumatism. While these arrangements are convenient in the description of cases and in illustration of operations they need not be considered here, as from the dental standpoint the functional capacity alone is of importance.

Associated with deflection there is more or less thickening in the region of greatest convexity (Fig. 7 a), while upon the concave side nature has endeavored to conserve the functions of the nose by filling it with a compensatory hypertrophy of the inferior turbinate bone (Fig.

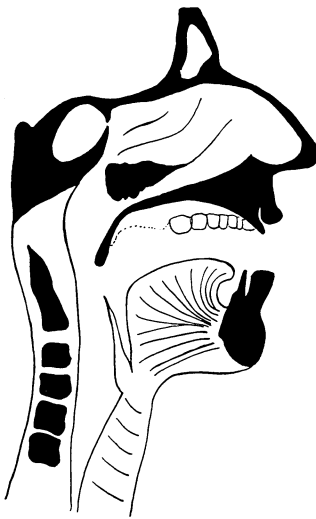


FIG. 4.



FIG. 5.

7 b). The symptoms arising from this complicated condition are similar to those resulting from adenoids. The diagnosis rests upon the presence of obstructive symptoms confirmed by intra-nasal examination.

Tonsillar Hypertrophy.

Chronic tonsillar hypertrophy, not only because it is an indication of the probable presence of adenoids in the same subject, but also because it is the cause of very definite disturbances in the shape and conformation of the dental arches, through perverted muscular activities, should always be considered in the pathology of such conditions, and it is well to remember that the removal of adenoids alone when accompanied by tonsillar hypertrophy, may fail to attain the desired end, and further that in the treatment of hypertrophied tonsils the post-nasal space should not be neglected.

**Etiological
Factors in
Malocclusions.**

Passing now to a consideration of the value of the knowledge of these several conditions, and their relation to the practice of dentistry, more particularly to the specialty of orthodontia, we note throughout all these conditions described the one prominent symptom of obstructed nasal breathing, often resulting in actual mouth-breathing with snoring at night in many cases. Also one can not fail to note the frequent coincidence of the two conditions, mouth-breathing and dental irregularity. This can not be called purely acci-

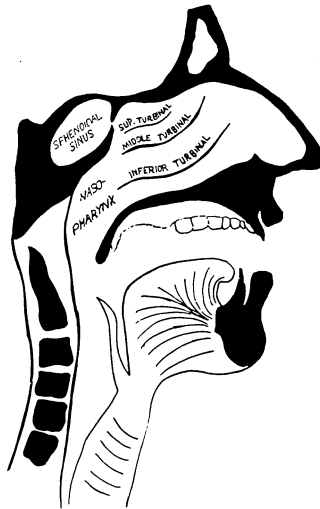


FIG. 6.

dental when we consider the cause and effect of the altered relation of the tissues and the jaws and mouth, particularly the unequal forces developed during mouth-breathing, and the mechanical effect upon the jaws and teeth.

To grasp these salient facts is to attain proper realization of the importance and gravity of these diseases. From the dental standpoint, let us go a little more into detail. During quiet normal nasal respiration the muscle forces in the region of the mouth are in a state of equilibrium. The teeth are in occlusion, the lips closed and in close relation with the oral teeth, the cheeks rest upon the outer surfaces of the bicuspids and molars, while the tongue is in close contact with, and gives support to all the teeth from within.

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During mouth-breathing the mandible is depressed, thus increasing the tension of the fasciæ and muscles of the cheeks, the teeth of the two jaws no longer exert a restraining influence over each other, the lips are parted and the tongue is removed from its normal contact with the teeth. Thus the normal equilibrium is destroyed and in its stead unequal forces are brought to bear on the teeth and dental arches.

This disturbance comprises an increase in pressure upon the buccal aspects of the teeth with a lack of proper support from within, which causes these teeth to move inward; at the same time, by this movement,

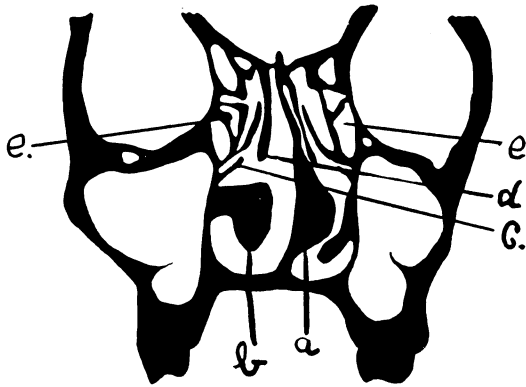


FIG 7.

pressure is brought to bear upon the oral teeth causing their movement forward.

These forces even when active over but a part of the twenty-four hours are capable when active through a long period of time of producing decided deformity, the character and extent of which depends upon many factors which vary greatly in each case. Probably the most common result is the so-called "open bite" deformity.

It seems almost superfluous in the light of this evidence to note that treatment should always be directed first toward the obstructive lesion when it exists, and that only when removal of this has been accomplished should active measures directed to the oral deformity be contemplated or put into effect. Neglect of this fact probably accounts for many failures in this class of cases. For even when correction is accomplished in the presence of nasal obstruction, it has been achieved at an unnecessary expenditure of energy, because of the constant antagonism of the perverted muscle forces during the time of active treatment. While after

the final removal of all appliances the jaws are still under the original deforming influence which in time may cause a return of the irregularity, the extent of which will depend upon many incompatible factors.

In making these illustrations actual sections were utilized, from which accurate measurements were taken and transferred to paper. Within the nasal chambers the arrangement is semi-diagrammatic in order to bring out more forcibly (1, 3, and 7) the pathologic conditions represented.

Figures 1, 3 and 7 represent the relation of structures in a section passing through the first molar teeth.

Instantaneous Relief in Cases of Blind Abscess.

BY JAMES E. KEEFE, D.D.S., Chicago, Ill.

Instantaneous, and often permanent, relief from pain following infection from a pulpless tooth may be obtained by the use of equal parts absolute alcohol and water. Whether the pain is caused by an upper or lower tooth the treatment is equally effective.

The preparation can best be used with what is known as a watch case atomizer. Fill the atomizer with the solution, then, having the patient recline the head a little, place the nozzle of the atomizer into the nostril on the side where the trouble is, spray the solution back into the nostril twice and the pain will be relieved immediately. In some cases there will be a slight amount of gagging and the solution will come out through the mouth, but this comfort is only temporary.

If the pain should return within fifteen minutes a stronger solution, say 75 per cent. alcohol and 25 per cent. water, may be used and the treatment repeated, but usually the 50 per cent. solution will be sufficient and will permit you to open up the tooth and give the patient relief.

The watch case atomizers may be obtained from almost any large drug house. If you can not get one use any atomizer that will force a spray far back into the nose.

A Reply to Dr. J. E. Hinkins's Paper.

By DR. E. C. KIRK, Philadelphia, Pa.

PART II.

We now come to the second phase of the paper, namely, that portion which is in criticism of the paper read by me before the Second District Dental Society in March, 1902, and which appears in the *ITEMS OF INTEREST* for July of the same year, entitled "A Clinical and Chemical Study of a Case of Dental Erosion." The main points which Dr. Hinkins deems it necessary to criticise in that exhibit are, as I understand them, two: First, that I did not verify my findings with the micropolariscope by the ordinary methods of chemical analysis. Second, that I have pinned my faith unwarrantably upon the value of the micropolariscope as a means for arriving at the conclusions in that paper.

Incidentally, and as a somewhat collateral issue, he takes me to task for my lack of certainty as to the nature of the compound which I referred to as "so-called calcium lacto-phosphate." I believe that these three features comprise the principal, if not the only, points at issue in the remainder of his paper.

I think we will all agree that the study of the chemical composition of the saliva presents one of the most intricate problems with which chemical science has attempted to deal. As a matter of fact, despite the fairly voluminous number of contributions which have been made upon the subject, our definite knowledge of the chemical composition of the saliva, especially when we come to consider its almost protean variations in composition in different individuals and in different nutritional states, is extremely limited. It is limited not only for the reason that the saliva lacks uniformity in composition, broadly speaking, but it is limited also mainly because the ordinary methods of chemical analysis, gravimetric or volumetric, are only applicable to its investigation in an extremely limited degree. I believe Dr. Hinkins to be in agreement with this general proposition, for he is reported to have said in closing the discussion of his paper read before the St. Louis Congress (*Dental Cosmos*, March, 1905, page 369): "Of all the hard things with which the chemist comes in contact, the saliva of the mouth is one of the hardest. It is changed by the diet, the habits, the nervous condition, etc. When you take the saliva and try to analyze it, you can not, because it is too complex, and in the analysis these complex substances are broken down into simpler ones, and we no longer have the properties of the original substances in the saliva."

In view of this very broad and emphatic statement, it does seem to my mind a little puzzling why he should have expected me to analyze the saliva at all by chemical means, and if he really believes the statement which I have just quoted from him, I question whether he would have had any faith in my results even if I had analyzed it chemically. But I agree, if not in detail, at least with the general idea of his statement, and it is because of that difficulty which he has stated, the difficulty in regard to devising analytical means for the study of the saliva, that I decided to make a study of the possibilities of the micropolariscope as an aid in throwing some light upon this intricate problem. And at this point I would call attention to the opening paragraph of my paper in which I presented this question before the Second District Dental Society, as follows: "I dislike very much to begin a talk with an apology, but there are two features of this presentation for which an apology is required. One is for the absence of my patient, who was taken ill at the last moment with an acute attack of a disorder which I think is at the base of his mouth difficulty, so that despite his earnest desire to be here, and my desire to have him here, he is bedridden and unable to be present. The second point is that my report is not of a finished investigation, but rather an uncompleted sketch or study of a case of erosion; yet I think it will portray a method of research which will let in some light upon the nature of this disorder."

**Value of the
Polariscope.**

I ask Dr. Hinkins and all who pass judgment upon this matter to take into account, and at its face value, that statement of my position. I have read with care the arguments which Dr. Hinkins puts forth in order to show the chances of error which can arise in connection with the study of crystal forms by the polariscopic method. It seems to me that these arguments do not differ in character from those which he has previously put forth on the same subject, and which I have elsewhere attempted to answer. I concede him practically all that he claims in regard to the possibility of error in this use of the micropolariscope. I can not do otherwise when I look back over not only months, but years, of careful patient study which I have made in order to find out for myself whether the polariscope could be made use of with any degree of certainty as an aid in this class of investigation. And what is apparent to me, and I think must also be apparent to any unprejudiced observer, is this, that Dr. Hinkins is attacking this question from a point of view diametrically the opposite of that from which I have proceeded with my own work in this connection, that is to say, everything that he has uttered within my knowledge bearing upon this subject is condemnatory of the use of the micropolariscope. He seems to have started

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out with the preconceived idea that because there are large chances for error to creep in in the use of the micropolariscope, therefore it must be altogether untrustworthy, and consequently useless.

My attitude toward the matter has been the reverse of this. While I have been familiar since 1875 with the polariscope in some of its relationships, and while I have realized that the possibilities of error in its use are large, I have taken up its study sympathetically, not from the point of view of its deficiencies, but rather to ascertain its possibilities. All that I have read of the published works of Dr. Hinkins and those associated with him, bearing upon their use of this instrument, indicates to my mind that they, upon the one hand, and I upon the other, have been working not only from opposite points of view, but by different methods. It is therefore not at all strange that we should arrive at different conclusions regarding the availability and usefulness of this instrument for the purposes under consideration.

Dr. Hinkins criticises a statement which he quotes at page 207, March ITEMS OF INTEREST, from my article in the *Dental Cosmos*, page 339, March, 1905, and in so doing gives it altogether a different meaning and application to what was originally intended. He does this by making a broad general application of my statement regarding the value of the micropolariscope in salivary analysis, when I have, as a matter of fact, in the statement which he quotes specifically limited my appreciation of its value to just that particular class of work. I still believe that in salivary analysis the micropolariscope gives, in competent hands, results as trustworthy as the ordinary methods of chemical analysis for that purpose. I believe this because of the extreme difficulty of analysing the saliva by chemical means, as to which latter difficulty Dr. Hinkins is clearly on record for the same belief, as I have already shown. But Dr. Hinkins's clever perversion of my meaning in this instance and in several others which I have noted in the course of this rejoinder, together with the general tone of his entire article, forces me to the conclusion that he is less strenuously concerned in getting at the facts of the situation from a scientific interest in the subject than he is in his endeavor to get even in some way with his opponent for a fancied injustice.

I pass by the criticism which Dr. Hinkins makes upon my reference to the spectroscope in an illustrative way, with the simple statement that he does not seem to have understood, even there, my meaning. He had criticised my statement that there were other methods than by chemical analysis by which chemical compounds could be determined, and in reply I instanced the spectroscope as an example. I did not say nor did I imply that the two instruments were of equal accuracy for the purposes under consideration. But I would have him consider this point, which

he doubtless will concede, that of the one hundred thousand or more tabulated compounds to which he refers, a vast number, in the very nature of the case, are excluded from consideration as constituents in the saliva. But he takes the ground that even if but two presented identical appearances under the micropolariscope, even then additional means would be required to distinguish them. This also I frankly concede. I concede his whole argument in support of his statement to the effect that the identification of certain compounds often requires days, months, and even years of elaborate study before all that may be known about the substance is definitely known. Yet, notwithstanding these facts, it is also a matter of fact that the observer constantly working in a definite line and with certain data gradually becomes more and more familiar with those data, and becomes able to recognize them and know them as such without being obliged each time to rehearse his proofs or cross-prove his work to the extent that one less familiar with the subject would be obliged to do, in order to arrive at that point in his study where he could reach more or less definite conclusions regarding his observations.

I take it for granted that it would not be necessary for Dr. Hinkins, nor for the many of my readers, to take a crystal of copper sulphate, for instance, put it through a complete chemical analysis, or subject it to a long line of physical and chemical tests in order to determine with reasonable certainty that it was a crystal of copper sulphate. And so with many other compounds. Again, the microscope, even without the assistance of polarized light, is to-day used extensively by those concerned in the study of urinary sediments to determine by its aid and from their form alone the nature of crystalline deposits in these sediments. So familiar do these crystal forms become that microscopists with at least a fair degree of accuracy are able to say that many substances having known crystalline form are either present or absent from the sediments of urine, and this is done without employing chemical analytical methods. Of course, the accuracy of findings made in that way becomes largely a question of training and experience of the observer; all of which work, and even the work of the analytical chemist, is open to the possibility of that form of error which we know as the personal equation.

What I am endeavoring to bring out is to show that with training and careful study, based upon more or less continuous observation, one's ability to draw conclusions from observations grows with experience. But in the case of dental erosion reported to the Second District Dental Society, and in which I reported the use of the micropolariscope in the detection of so-called calcium lacto-phosphate, I said, as already quoted, that it was not a finished investigation, but rather an incomplete sketch

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or study of a case of erosion. The methods by which I arrived at the conclusion that the crystals found in the saliva under consideration are of so-called calcium lacto-phosphate have already been published; they have been the subject of criticism in the paper of Dr. Hinkins and need not be rehearsed.

Ewald's Test. Dr. Hinkins criticises the fact that I did not test the saliva of the patient by means of Ewald's delicate test for lactic acid. I find that authorities are of the opinion that the test of Ewald is not characteristic except in the proved absence of certain other compounds, tartaric, citric, malic acids, for example, and the class of organic acids which Dr. Hinkins has found to be the result of fermentation produced by certain mouth bacteria. I did make the Ewald test of the saliva of this case a number of times, but because of the uncertainty in my mind as to its accuracy, under the circumstances I did not report it, as I should have expected someone to call me to account for having placed too much confidence in a test which was known to be open to large chances of error.

As related in the opening paragraph of my ITEMS OF INTEREST paper, I apologized for the absence of my patient on that evening. Let me state in further history of the case, that from that day to this I have never been able to get into contact with the patient again. I have written to him several times. I have sent messages to him, and I have endeavored through his friends to induce him to let me proceed with the investigation of his oral fluids. He has declined, and I have consequently lost sight of him, and have therefore been unable from lack of material to proceed further with the subject except to a very limited extent. I have never since met with another case like it in which the crystals which I believed to be so-called calcium lacto-phosphate appeared in the oral fluids to anything approaching the amount that I observed in the case reported. I have, however, seen a number of cases in which apparently identical crystal forms occurred in the urine, and all these cases were patients suffering from organic disease of the liver, mainly yellow atrophy. In these cases I have detected the presence of lactic acid by Ewald's test, carefully applied with the usual precautions for the elimination of error, and in the course of the study of these urines I endeavored to devise a means for producing a chemical reaction which might be applied to salivas while undergoing observation under the micropolariscope, and I found that if a dilute solution of about five to ten per cent. of zinc chlorid were allowed to flow under the cover glass by capillary attraction into the field in which this so-called calcium lacto-phosphate crystals appeared, that in the course of from thirty minutes to one hour a re-crystalization appeared, having all the characteristic appearances of zinc lactate.

It is generally conceded by chemists that the manner of crystal formation, the aggregation of the individual prisms and terminal angles and other optical features of zinc lactate, are so characteristic as to offer one of the very best means for the detection of lactic acid. Having found this reaction to offer encouraging results in the case of the crystals of so-called calcium lacto-phosphate in the urine, I made the same tests with such few of the specimens as I had of the original crystals obtained from the saliva of my erosion case, and obtained the same reaction. I regard this test, while it is not to be considered final, as strong confirmatory evidence of my original conclusion.

**Calcium
Lacto-phosphate.**

And now as to the so-called calcium lacto-phosphate. A very considerable portion of this paper is devoted to ringing the changes upon my use of that term. I used the term so-called calcium lacto-phosphate, because I was uncertain as to its chemical composition. I was uncertain as to its chemical composition because I could find no literature dealing with the problem of what takes place when calcium phosphate is added to lactic acid, or when lactic acid is added to calcium phosphate. There is a thing which is called calcium lacto-phosphate. It is the basis of a pharmaceutical preparation recognized by the U. S. Pharmacopœia, and directions are therein given for its preparation. It may be bought from the pharmaceutical chemist. It was recommended prominently some decades ago as a nutrient therapeutic agent, to be administered to women during the period of gestation, for the purpose of restoring in assimilable form the lime salts which were assumed to be lost in large quantities from the osseous system of the mother during the gestation period, and was recommended also as a possible means for preventing what has been called the tooth caries of pregnancy. But nowhere have I been able to find any account of an accurate research undertaken to determine the exact character of this substance which is called calcium lacto-phosphate. I do not know its composition, and I may say frankly that I do not know it now, for what Dr. Hinkins has produced in evidence as to its composition does not to my mind satisfactorily explain it.

I wish to disclaim any proprietary right in the naming of this compound, for the reasons which I have already given, or briefly because the substance is one which received its name probably before most of us were born. I note this disclaimer because the essayist refers several times in his paper to "Dr. Kirk's so-called calcium lacto-phosphate" as a myth. It is certainly not and never was Dr. Kirk's calcium lacto-phosphate.

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We have been presented with the results of what is apparently a long and painstaking research to determine the nature of this compound in question, and the writer says, as the result of his work, that it is calcium acid lactate. He has shown with much detail the pains which he has taken to secure, in the first place, chemically pure lactic acid of fermentation, and the methods by which he has secured it in the pure state. He has then formed the compound by bringing it into contact under proper conditions with purified calcium phosphate. He has recovered by careful re-crystallization a salt which he determines by analysis to be calcium acid lactate, and he shows by an equation the reaction by which, he thinks, calcium acid lactate is probably formed under the circumstances. To all of which I take not the slightest exception, assuming his hypothesis as to the chemical reaction involved and his analytical methods to be correct, upon which assumption I grant at once that I am unable to see any fault in his general line of reasoning up to this point. But there is one feature which occurs to me in connection with his statement with reference to the relative strength, chemically speaking, of the lactic and phosphoric acids involved. He states in effect that lactic acid has been proved by physical and chemical means to be a fairly strong acid, and is present in considerable excess in these experiments, and further that as strong acids always displace weak ones from their salts, it becomes clear that the above reaction is the one that we should expect.

I infer from the foregoing that he holds the view that lactic acid is a stronger acid than phosphoric. I doubt this as a general proposition, for the reason that under other circumstances phosphoric acid will precipitate calcium from its combination with lactic acid, as always occurs in the making of the officinal preparation of the so-called syrup of calcium lacto-phosphate. It is one of those cases where the factor of mass action governs the direction in which the precipitation will take place, and I suspect that it is this factor which has given rise to the uncertainty which has existed regarding the chemical nature of the resulting compound formed when calcium phosphate is dissolved in lactic acid. This point, however, has but a minor bearing upon the main question, which I find has been the point to which all of this acid calcium lacto-phosphate discussion leads up to and which is the real point at issue.

Summing up the case to this point, Dr. Hinkins says: "So, when Dr. Kirk says, (page 596, *Dental Review*, July, 1905) that 'the committee did not know that lactic acid could not be neutralized by calcium phosphate,' he was in error in regard to his chemistry."

The report of the committee referred to appears in the *Dental Review* of April, 1905, page 321, and among other things a description is there recorded of the method by which the committee had endeavored

to prepare for study crystals of calcium lacto-phosphate, and regarding the method of its preparation the report states: "This was prepared by treating calcium phosphate with lactic acid. After the reaction had taken place, it was diluted with distilled water, boiled, filtered, and set aside to crystalize for one week, at the end of which time, crystals were formed in the syrupy mass, showing the excess of acid used."

It was in relation to this statement that in the criticism of the report referred to I said (*Dental Review*, July 15, 1905): "That was a mistake, and it did not show that an excess of acid had been used, but it does show that the committee did not know that lactic acid could not be neutralized by calcium phosphate." Dr. Hinkins will, I think, admit that there was an evident excess of acid in the mother liquid from which the lactic acid salt was crystalized in the preparation which it is reported, as above, that the committee, of which he was one of the members, made, and I think in view of subsequent research which he has made in order to determine the character of this reaction, he will admit that he still comes out with an acid end-product.

In the performance of this experiment of adding lactic acid to calcium phosphate the result is acid in reaction, either in the first instance from the phosphoric acid set free from combination, or if the compound is redissolved, recrystalized, and freed from the phosphoric acid by washing with ether, and then redissolved, it is still acid from lactic acid. I fail to see that the conclusion arrived at as the result of this long research into the nature of so-called calcium lacto-phosphate destroys the general truth of the assertion, which I assume it was intended to upset, namely, that the committee did not know that calcium phosphate would not neutralize phosphoric acid. As directly bearing upon this point, Miller asserts as the result of his experiments that calcium phosphate added to lactic acid will not diminish the decalcifying power of the lactic acid. Another evidence that lactic acid will not neutralize calcium phosphate.

I have gone over with much care the record of the analyses which Dr. Hinkins gives of this compound, which he designates as calcium acid lactate, and there are a number of features in connection with it which I do not nor can not understand. I am unable to understand what he means, first of all, when, as the result of his analysis, and in spite of all of the excessive care which he seems to have exercised in the preparation of the compound, he makes the statement that "this analytical data, then, shows that the substance is calcium acid lactate, mixed with about ten per cent. of calcium phosphate." If it is mixed with ten per cent. of calcium phosphate, what justification has he for the use of the word "mixed" in connection with the compound? What line of reasoning has led him to decide that this ten per cent. of calcium phosphate is mixed



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rather than chemically combined with the acid calcium lactate? If this ten per cent. of calcium phosphate occurs in "the substance," would it not seem to indicate that the ten per cent. of calcium phosphate was originally in molecular combination with the calcium acid lactate before he broke up the compound by boiling it, as he has reported, in which event the compound would be the lacto-phosphate rather than the acid lactate?

There is an evident misunderstanding upon the part of Dr. Hinkins as to the meaning of my words, in which in the *ITEMS OF INTEREST* paper, I have spoken of two classes of erosion. I regret that I have not been able to make my meaning clear to him, for, notwithstanding the fact that I have already endeavored the second time to express my meaning, he nevertheless refers again to the same point and seems to be unable or unwilling to comprehend what I have said.

The original statement, which he has repeatedly called into question, occurs in my *ITEMS OF INTEREST* paper as follows: "The determination of the solvent in this case and general nature of the disorder, affecting as it does all of the teeth, would seem to make it necessary to divide our erosion cases into two classes—those in which the erosion is general, in which all the surfaces are uniformly involved, in which lactic acid is the solvent acid; and the other class, which is distinctly due to the exudate from an abnormal buccal mucous gland or glands, the acidity of which is due to one of two things, the acid sodium phosphate or the acid calcium phosphate."

I shall endeavor once more to make clear what I have tried to say, and in so doing I would put it in this way: If it be true that lactic acid produced by fermentation in the mouth can be produced in such quantities as to dissolve the mineral salts of the teeth, causing the loss of structure from all of their surfaces, then in that case it would seem to me to be necessary to create a distinct class of erosion cases, distinct from those which I think we can in the present state of our knowledge agree are due to the solvent action of altered mucous secretions from buccal mucous glands. I do not know whether even this will make my meaning clear, but let me say that I never have said that lactic acid was responsible for all cases of general erosion, nor that there are not cases of general erosion caused by other substances than lactic acid. What I want to bring out is the idea that the distinctly different sources of origin for these corrosive or solvent agents which act upon the teeth, producing what we term erosion, would seem to make it necessary to classify them separately with reference to the origin of the solvent involved in the production of the disorder.

In the paragraph which I have quoted from my *ITEMS OF INTEREST*

paper, as above, I have used the phrase "the determination of the solvent in this case." I can readily see that from his point of view Dr. Hinkins has attached a larger meaning, a more technical meaning, to that term, and given it a greater force of application than was in my mind at the time that I used it. If I had used the word "detection," instead of the word "determination," it would perhaps have expressed more clearly the thought that was in my mind. In its strict sense I quite well understand that the word determination in this connection may be understood to have the force or the meaning of the word demonstration, and yet either of these words may be used with a certain degree of relative applicability, according to the circumstances. To my own mind and as the result of my own studies of the case that I referred to, I was convinced that the salts which I found in the saliva of this case were lactic acid salts. I am still of that opinion. On the other hand, from the point of view of the doubter, I can see that he may have given to this phrase a more literal meaning than I intended to express.

I have made no claim to having solved the great problem of erosion at a stroke of the pen; the utmost that I have done has been to make an effort to attract attention to some of the aspects of this disorder and to call attention also to a method of study which I firmly believe, if sympathetically pursued in the spirit of constructive instead of destructive criticism, will yet be found to be an aid of very great value and importance in assisting this work. I concede the very great value of the work which Dr. Hinkins is doing by quite other methods, and its importance also in bringing to bear additional light on this complex question. It is my earnest desire not to even appear to be in an attitude of antagonism toward him or his colleagues associated with him, but rather to co-operate with him and to encourage to the best of my ability his most praiseworthy efforts.

**Photographs
of Crystals.**

With regard to the exhibit of photographs of crystal forms, I have to say first, that they are photographs, and that very fact at once eliminates their value as representative of what one sees under the micropolariscope. Secondly, they are for the most part made from specimens prepared by a wholly different technique from that pursued by me and illustrated in my paper which is criticised by Dr. Hinkins. The difference in technique is that, for the most part, Dr. Hinkins's specimens are of slow crystallizations, not made under the cover glass of a microscopic slide, while a number of his pictures are reproductions of photographic reproductions that have been previously printed as book illustrations. The evident intent of the whole exhibit as I interpret it is to prove the contention that there exists great dissimilarity in the forms of

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crystals, and that because of this dissimilarity, it is scientifically impossible to accurately determine the nature of a crystalline chemical compound by means of the micropolariscope. I admit fully the fact that there exists great dissimilarity in crystalline forms, that these may vary almost infinitely according to the nature of the compound and the conditions under which the crystals are produced and studied, and Dr. Hinkins is quite welcome to all the comfort which that admission may give him. But recognizing that very fact in the beginning, I set about it to see if it were not possible to eliminate certain of these differences by reducing the conditions of observation to a degree of uniformity and as a prerequisite adopting a uniform technique for preparing specimens for observation. In his exhibit Dr. Hinkins shows the opposite intent of including rather than eliminating the points of difference, and no attempt at uniformity of technique is made; on the contrary, he has strained at the very opposite of uniformity by presenting a heterogeneous jumble of pictures of preparations made in different ways, photographed under dissimilar optical conditions, by polarized light and ordinary light, reflected and transmitted, along with ordinary photographs of book illustrations. All of which, whatever may be the value and significance of the individual illustrations, they are when taken collectively utterly worthless as a comparative exhibit of the optical properties or crystallographic forms of the substances in question as seen under the micropolariscope.

Besides which his designations are misleading and erroneous in certain instances. Figure 26 is described as a "single crystal of calcium acid lactate in ordinary arc light." This is an error; it is not a "single crystal," but an agglomerated mass of crystals. The same is true of Fig. 27; Fig. 33 is described as "round crystals of zinc lactate." There is no such thing known to science as a round crystal of zinc lactate or a round crystal of anything; if a thing is round it is not a crystal. Figure 34 is said to be a photograph by "ordinary light," while Fig. 35 is the same substance by "polarized light," whereas as a matter of fact Figs. 34, 35 and 36 are all by polarized light, as is proven by the black background and light figures, the optical reverse of Fig. 37, which is by ordinary light, as stated.

Finally, in regard to Dr. Hinkins's chemical experiment of adding sodium carbonate to a hot solution of dihydrogen sodium phosphate, and producing thereby a copious evolution of carbon dioxide, I can only say that I am astounded that he would have the temerity to make such an exhibit in these latter days as an attempted refutation of the reaction that I have offered as accounting for the production of acid sodium phosphate in the human body. Some years ago I was of the same opinion

as Dr. Hinkins upon this point, and I believe I am, fortunately or unfortunately, on record for that belief in Burchard's "Pathology and Therapeutics," but I have learned better with the passage of time, and if Dr Hinkins will take the trouble to study the existing views as to the causation of the acidity of the urine, which we know is due to this same acid sodium phosphate, he will become very much enlightened on the question to which his experiment is supposed to apply. The theory of the conversion of the alkaline into the acid phosphate of sodium by the agency of carbonic acid is not my own, but is that generally held by physiologists and physiological chemists at the present time. I have merely shown that when produced in excess it is eliminated by other structures than the kidneys, and among these other structures the buccal mucous glands, and in that way it contributes to the production of erosion. The same principle is involved in the conversion of the basic into the acid phosphate of calcium.

Finally, I would suggest in this connection that what takes place in the human body in the matter of chemical mutations is quite another and different affair from the chemical activities that may be exhibited in an aqueous solution in a glass beaker at 100 degrees centigrade.

A Plea for More Thoroughness in Diagnosis, More Conscientious Operative Work, and a Closer Application to Our Dental Literature.

By G. W. COCHRAN, D.D.S., Erie, Penn.

A resume of 1906 dental literature in our many most excellent journals (of which seven are received monthly by the writer) reminds one of the many varied subjects that have been covered by the respective "authors." We should all feel that we have been greatly endowed with knowledge from great fountainheads.

There are, no doubt, just as good men practicing dentistry to-day who have never appeared before a society with a paper, or even in print with original contributions. Delving into the depths of science requires time and many busy practitioners do not feel that they can make this sacrifice. Those who are sufficiently charitable to sacrifice their valuable time with contributions and a desire to enlighten every one who may read them are entitled to special praise. By all means give us an abundance of original papers in our many magazines.

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Just what proportion of dental practitioners subscribe for, carefully read, properly digest and assimilate the many most excellent scientific papers that are being published monthly in our various magazines is highly problematical.

The writer observes that one of our leading publications claims some seventeen thousand monthly circulation; many dentists, no doubt, subscribe for more than one journal. If the rank and file of dentists would take two or three good dental periodicals monthly, read and study them as they should be studied in order to properly assimilate what they contain, I venture an assertion that there would be a great awakening of the profession and the public, but more especially among the medical profession. Then, and not till then will they think we are truly stomatologists.

Judging from clinical experience as cases come under one's observation every calendar month, many dentists (and not a few physicians) are woefully weak in correct diagnosis, or if they have arrived at a correct exposition of their cases, they display a mighty show of indifference as to their ability to eradicate the abnormal conditions for their patients or else so many people would not be obliged to seek others for relief.

This paper is written in the most friendly spirit, with malice toward none; but in order to make it effective, we purpose to pull the throttle wide open, and assume a rather radical pace throughout its course, so much so, that the writer is fearful the wise Editor will look at it through his "specs" with considerable doubt as to the propriety of giving it space in his valuable magazine.

Getting back to our subject again, we say some dentists (mind you, not all) will treat, and treat, and continue to treat lame teeth and jaw complications, and being unable to cure the afflictions for their patient, would rather see the patient lose the tooth or teeth, than recommend him to some one who can relieve him, and in cases of jaw complications, would apparently prefer to see the unfortunate individual pass into the undertaker's hands rather than honorably acknowledge their inability to properly treat the condition and recommend the afflicted one to a practitioner who might be able to diagnose the case correctly and straightaway afford relief.

A Case of False Diagnosis.

A slight digression for amusement's sake. Once upon a time a lady suffered most excruciating reflex odontalgia that took up its abode in the left gasserian ganglion. She doctored with the family physician for neuralgia for some ten days, and during this ten-day period had been advised to consult her dentist for possible tooth complications. She

was told by two different dentists (good ones, too) that her condition was plain neuralgia and would require time to wear off (a heap of consolation to one in such agony and pain). So depressed was she, that she remarked that death would be welcome in preference to a continuation of the excruciating pain she had endured in close successive paroxysms for more than a week. Her family physician had gone his limit with the use of opiates, and was conscientious enough to frankly acknowledge he was at his wits end as to what to recommend. He felt that her condition was one that required the services of a nerve specialist, and recommended going to a big town and consulting one. Wise council prevailed and relief was sought for and obtained before trying the nerve specialist. Upon first examination the roots of a first left upper molar (off level with the gum tissue) presented for consideration; also the left upper cuspid contained a large cement plug; pulp had died and this tooth had been tapped to relieve a decomposed pulp; the canal had remained open for some four years, and was nourishing a blind alveolar abscess. Most diagnosticians would have been quite sure this particular tooth's condition was in itself sufficient cause for all the pain and suffering—but not so—pain of the character this patient had endured is very seldom found associated with alveolar abscess. Further search revealed a left lower second bicuspid, which when the pulp canal was explored, produced a shock that reached the left gasserian ganglion and made the patient almost frantic for a few minutes. A chloroform compress was immediately placed over the ganglion region and cocaine was hurriedly placed in the cavity of the tooth, and in less than ten minutes all pain had disappeared entirely. The pulp was extirpated under pressure anesthesia, being partially dead, due to exposure.

Decomposing pulps in teeth and calcific formations or pulp nodules, are a prolific source of reflex disturbances of the character this patient suffered, *but alveolar abscess never*.

The writer thinks that practitioners who so far forget their professional duty toward their patient, as to plod along and jeopardize the individual's health rather than recommend him to some one who can diagnose and straightway afford relief, are guilty of unprofessional acts far greater in magnitude than many of our other unethical irregularities.

Again the writer has seen alveolar abscess conditions that were treated for a long period and the patient's health gradually and rapidly being undermined with a true alveolar necrosis, the results of a former alveolar abscess, and while this practitioner was unable to effect a cure after some two years sinus treatment, he was not sufficiently honorable to admit his inability to cure the lesion, but permitted his patient to suffer until she

Case 2.

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became so depleted she was forced to seek the services of another who did know how to properly diagnose her condition and eradicate the necrosis completely, and thus restore her to good health.

This particular case was a right upper lateral incisor supporting a Bonwill porcelain crown which was adjusted by Dr. Bonwill, and had seen seven years' service. The tooth unfortunately developed an alveolar abscess. It had been treated through the sinus for a long time. Eventually the sinus disappeared, but the tooth with the firmly adjusted crown continued lame. Patient's general health became impaired; took on every evidence of a general neurasthenia, a marked debilitated condition, restless nights, loss of mental activities; in fact, her condition was assuming proportions that were causing her intimate friends to fear for the worst.

The alveolar pus sack had thoroughly decomposed and true alveolar necrosis had been in existence for more than a year; the necrosis had extended through into the floor of the nasal chamber, and in this manner was Nature taking care of the drainage, and this accounted for the absence or disappearance of the former sinus. The gradual systemic disturbance was due directly to absorption of pus via the cancellated bone structure; the discharge of pus from necrosis is not so profuse as with softer tissues, but is of a far more virulent character, more on the order of mephitic gas, conceded by chemists to be the most poisonous gas known to chemistry.

Pulp Mummification Condensed.

Many dentists blunder along treating teeth containing considerable calcific deposit or pulp nodules, and in lieu of having sufficient energy to clean out the constricted pulp canals and fill them properly, they would rather content themselves with the lazy and indifferent operator's method and trust to mummifying pastes to maintain quiescence. Now this is all wrong—what are the results of such methods? Simply this, the mummifying paste spends its germicidal properties; in a year or two bacteria commence to propagate, and an alveolar abscess is sure to result unless the tooth is opened for the escape of mephitic gas and pus-micro-organisms through the apical foramen. Having opened a few dozen teeth that had been treated with mummifying paste, the writer knows whereof he speaks. With a 20 per cent. solution of sulphuric acid, there is precious little excuse for such practice. I dare say, millions of multi-rooted teeth are consigned to the forceps annually, due solely to lack of thoroughness in mastering canal treatment and filling. It requires considerable will-power to work over multi-rooted teeth for three hours (more or less), constricted pulp canals and pulp nodules to contend with, and to find at the terminal end canals of normal size. Operators who

are thorough in this particular will surely agree with me on this point at least.

Now the moral of this much neglected canal treatment is simply this: these unfilled canals in this class of calcified teeth containing pulp nodules, exostosed roots with obtuse and right-angle curves, are bound to cause serious trouble. I say without much fear of contradiction that this class of teeth are the main cause of fully 98 per cent. of all the neuralgic and reflex odontalgia disturbances about the jaws and face.

Reflex odontalgia that locates in the gasserian ganglion disturbs one's equilibrium faster than any pain the writer knows. Why neglect thoroughness in our pulp canal work when we are cognizant of these proven clinical facts? Unfilled canals in any tooth sooner or later develop alveolar abscess, and no wise practitioner that knows anything at all about the surgical treatment of chronic or incipient alveolar abscess, would think for one minute of scooping out an infected pocket at the apex of a tooth, and not be positive in his own mind as to the exact interior condition of said tooth. If he does attempt surgical procedure upon such teeth his efforts will be rewarded with nothing but a series of failures. Far better is it to remove the old canal fillings unless you are positive of the skill of the previous operator.

Twelve years of clinical experience suggests the following advice. By all means make sure your canals are properly enlarged, so they can be well filled. Keep an accurate record of all canal work; and any canals that you find entirely obliterated in the molar teeth, make special record of. In the future should any tooth develop an alveolar abscess, treat surgically by making a free opening at the infected portion, curette away the pus sack, excise a portion of the root, irrigate with a good antiseptic solution, pack the pocket with 5 per cent. iodoform gauze, maintain daily treatments for two or three weeks permitting granulation from bottom outward, observing throughout the whole procedure thorough surgical cleanliness, and your tooth will get well.





American Society of Orthodontists.

Discussion of Dr. Pullen's Paper.

I regret that Dr. Angle is not here to discuss this **Dr. Alfred P. Rogers.** very interesting paper. I shall try, however, to present a few ideas from my own experience which may be of value. I believe it is well to emphasize the great importance of retention; because so many have become interested in orthodontia and have allowed those prominent features of art and occlusion to occupy their minds to at least the partial exclusion of this very important feature. Many general practitioners are interested in this work, some failing utterly to appreciate the value or necessity of proper retention. The glowing features of treatment have occupied their attention almost exclusively, and cases are undertaken and treated with absolutely no attention given to retention, which, if not understood and properly applied, renders the work worse than worthless, because our efforts have been spent in vain, and months or years of valuable time wasted.

In order to bring the subject of retention clearly before the profession, it seems to me that we must agree upon certain definite principles, just as we do in the treatment of malocclusion. Dr. Pullen very wisely referred to the age problem, and I am going to emphasize what he has said by insisting that we shall commence treatment in the early stages, if necessary in the temporary set, guiding the permanent teeth gently into their proper places; then when they erupt the interlocking of the cusps affords an efficient and permanent retention. Multitudinous movements to

which the teeth are subjected in pronounced cases makes the matter of anchorage during retention a subject to tax our most careful and sincere thought.

The idea presented by Dr. Abell regarding the restoration of spaces for teeth not yet erupted appeals to me, because in the establishment of retention we sometimes realize the fact that greater growth will take place for the admission of the teeth that are to come; therefore in placing retainers where the anterior teeth have been moved into occlusion and the first molar is in position, the lingual wire should be so constructed that it may be stretched to give ample room for the bicuspid and cuspid to come later.

It is undoubtedly true that we learn most through our failures. This idea calls to my mind a case of the third class which I once treated, in which the entire upper arch was in lingual occlusion with a lingual tipping of the molars and bicuspid of the lower arch, although the arch was of normal size. The restoration of occlusion was accomplished and the upper arch which was greatly expanded was retained by means of a rubber plate, which was kept in position for eighteen months, but gradually with the settling of occlusion the lower arch showed still greater expansion until the upper teeth were again slightly in lingual occlusion although they had not changed their position. This shows the great force of the inclined planes and how important it is that they should be placed and retained in their correct positions. This case was a partial failure, but it carries with it a valuable lesson.

In the retention of the second-class cases Dr. Howe of Boston spoke to me of a very efficient aid in dealing with these cases. The idea was to band the lower bicuspid, attaching thereto a spur extending between the inclined planes of the upper cuspid and first bicuspid. Regarding the retainer for which Dr. Lourie is given credit, I would like to say that I have elevated anterior teeth and retained them in this manner, but have noticed that sometimes the molars have tipped slightly, allowing the anterior teeth to settle slightly. This may be overcome by extending a spur between the cusps of the second bicuspid, making its attachment on the molar band.

Where the upper incisors have needed to be considerably depressed in their sockets, I have re-enforced the molar anchorage by attaching to the first bicuspid as well.

I think that would be an efficient means, myself.

Dr. Rogers. There are men here of very much more experience, and I should like to give way to them for the further discussion of this paper.

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Dr. Abell. I have found we need more room for the permanent bicuspid and cuspid than we have between the first permanent molar and permanent lateral. The temporary teeth do not allow of enough space.

Dr. Young. I have measured a great many teeth, and am satisfied that the combined widths of the deciduous cuspid and molars is sufficient to accommodate the cuspid and the bicuspid when they come in; that is by actual measurements in hundredths of an inch, and I believe Drs. Hawley and Watson will bear me out.

Dr. Hawley. I think Dr. Young is right. The second temporary molar, as you know, is considerably wider than the second bicuspid; also the permanent cuspid is wider than the temporary cuspid. So you have one permanent tooth wider than the temporary, and one temporary tooth wider than the permanent one, but there is very little difference in their combined widths, where I have measured. I think it just about adjusts itself, if the temporary teeth are normal. It would be safer of course, if there were a few hundredths of an inch greater space than needed, and in most cases there is.

Dr. Ottolengui. When you have first molars in place, and your four incisors erupted, that portion of the bone is usually full grown; otherwise we would be obliged to take into consideration the question of whether there would be an additional space between the first molars and lateral incisors for the accommodation of these teeth. Evidently these gentlemen think not, because they are simply measuring the temporary teeth and expect the permanent teeth to fill the same gap.

There is this fact: that the second teeth erupt in a little larger circle, and consequently there is a little additional space gained in that way.

Dr. Baker. It seems to me that you are getting this question of space down pretty fine.

What is the objection to getting all the space you need and even more? It does no harm, for as soon as your teeth are in place the other teeth will settle right back until they are held by contact. It is my rule to carry the teeth a little beyond sufficient space to bring the teeth into line.

Dr. Abell. This very point has been one I have experienced much trouble with, and I believe Dr. Baker is right in what he says about gaining a little more room. Sometimes if we try to retain the incisor teeth in that position, we will have more or less space, and this afternoon I want to show you in my

clinic a little device I have used to allow for the settling back of those teeth without changing the retention.

From the few cases I have made measurements of, I have found that the combined widths of the first and second temporary molars and the canine is more than the combined width of their permanent successors. We know that if the temporary molars are prematurely lost, the first permanent molar moves forward. This movement also occurs in the few months elapsing between the loss of the second temporary molar and the eruption of the second premolar. The greater width of the temporary teeth, as compared with the width of the permanent successors, would seem to be to allow for this encroachment on the space by the forward moving first permanent molar.

Although the title of Dr. Pullen's paper is on retention he said very little about retaining fully corrected dentures, and it is on this line that I would like to say a few words. I have given retention a great deal of serious thought and there are a few points that I have discovered in my thirty-five years' practice which are of vital importance. First, that it is more difficult to retain teeth without injury to them than it is to bring them into their proper position.

Second, it is very desirable that retainers should be so made that the corrected cases will improve during the period of retention, and not move in the wrong direction, for the reason that it is about impossible to regulate so that all teeth will be in perfect occlusion at the time of putting the retainers on.

Third, that portion of the retainers that rests against the teeth should cover as small a surface as possible to prevent the accumulation of secretions, hence lessening liabilities of decay.

Fourth, it is very desirable to have retainers made so as to be adjustable by the operator with as few number of bands as possible around the teeth.

Fifth, that it is not wise to have removable retainers for the reason that the patient is apt to remove them too often and leave them out too long at a time.

Probably the most common as well as the most undesirable retainer is a rubber plate fitted closely around the teeth. This to my mind is the most injurious of anything that could be used, especially for young children. Not but that they hold the teeth in position, but the injury they cause to the teeth is the objection. I have seen teeth nearly ruined from decay by this use.

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Last, but not least, retainers should be so made that as little as possible should be visible and that portion that is exposed not unattractive.

I wish to throw out a suggestion. Dr. Pullen **Dr. Ottolengui.** raises the point that it is always a question as to how long retention should be continued. A good solution for all cases is this: Begin the retention with a fixed appliance in practically all cases, and when you think you can dispense with that appliance, to be worn at least every night, and I usually say to the girls "wear it until you get married."

I desire to commend what the doctor has said **Dr. Varney E. Barnes.** on early regulation. Early regulation is one of the greatest factors in retention. Our best retainer has been said to be the permanent alveolar bone. To go a step further I would say that the best retainer is the first alveolar bone deposited about the tooth. In order to get this we should begin our regulation before the eruption of the lower central incisors. This means the regulation of temporary teeth, and the mechanical production of spaces that should have been growth spaces. Many orthodontia cases are shown as corrected when they are not; the full interapical spaces have not been restored. We get this space best by early regulation, that is, by doing what nature did not do. Many of our cases do not retain because we depend too much on the alveolar bone about the incisor teeth. This is the weakest alveolar structure in the mouth and we have been calling upon it to do too much.

I have been studying the development in temporary arches, and have come to some conclusions, which I shall quote from an article in the *Dentist's Magazine*, December, 1906. "Many observations taken in the past four or five years seem to indicate that in the normal temporary dentition in a child of about four or five years, the following law prevails:

"The central plus space distal to it equals the width of the permanent central. The lateral plus the space distal to it equals the width of the permanent lateral. The cuspid plus the space distal to it equals the width of the permanent cuspid. In some instances the temporary tooth plus the space distal to it may be a little broader than the width of the succeeding permanent tooth, but it is never less, in the normal individual. This law seems to be corroborated by the fact that the first and second temporary molars are succeeded by teeth of less width. The wise intention of Nature being to provide sufficient space for the normal formation and eruption of the permanent teeth, not only the bicuspids and molars, but also the incisors and cuspids, development of the dental arches takes place in the three directions which are of vital significance to orthodontists. These are: The antero-posterior, the buccal and the vertical.



"The antero-posterior and the vertical developments are not completed entirely until maturity, the third molars marking the completion. The buccal development seems to be complete in the child detention at from four or five years of age, back to the first permanent molar. After that age the development continues along diverging lines permitting the eruption of all of the permanent molars. Too much credit has been given, in the past, to the crowding forces of erupting teeth. This force is really developmental force and must not be expected to accomplish normal results when it, itself, is arrested or entirely suspended.

"The absence of growth spaces between temporary teeth is as surely and definitely an irregularity or deformity as would be the irregularity of the permanent teeth succeeding it."

Dr. Pullen's paper adds more evidence bearing on the difficulties of retention. Dr. Angle presented recently a paper bearing upon the tongue and lip habits in children, which will be taken as an epoch maker in orthodontia when the full significance of these habits is understood.

This matter is one of the things that certainly must be considered hereafter in the retention of a case. Up to the present time it has been scarcely noticed, and yet it must account for many failures, the causes of which have been obscure.

In listening to the subject as it was presented, many things that had puzzled me were made plain. It is almost discouraging to think of these things working against us in the dark, entirely involuntary on the part of the child—unnoticed by the parents, who often are loath to believe when shown, and who underestimate our fears in regard to them; and yet they are most potent forces, working steadily to undo our most careful and thorough treatment.

I have been asked by several for an explanation of the lingual arch retainer, which has been referred to as having been suggested by me. At our Chicago meeting last year I presented the lingual arch as a basis for retention. We select certain teeth as a basis for diagnosis, and in moving the teeth we take the arch as a basis for moving appliances, usually. For the purpose of retention, after trying all the various methods with which I am familiar, I adopted the lingual arch as a basis.

The lingual arch first suggested itself to me in Class II cases, after jumping the occlusion, because the occlusal spur on the buccal side of the molar band had a tendency to tip the molar through increased leverage: also to rotate the molar. I joined the two molars with a lingual arch of irido-platinum. You can use whatever metal answers your purpose best,

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however. I used it because with a low carat of gold solder the stiffness of the metal was not materially altered.

The lingual arch re-enforces the molar retainers, in two ways: it prevents rotation, and tipping. Since this arch was used for re-enforcing those molars, I adopted the plan of retaining other teeth that had been moved, by attaching to this lingual arch. If a central incisor was rotated, I attached it to the lingual arch with a spur hooked over the arch in the way which would antagonize the return to its abnormal position. This attachment can be arranged so as not to prevent lengthening or shortening. I think it vitally important that a tooth should have the possibility of adjusting itself through the influence of occlusion, and I, therefore, avoid rigid attachment as much as possible. We must have some rigidity, however, at times.

If the molar has been rotated during treatment, and one wishes it to settle back to its original position or an improved position, you may transfer the attachment to a bicuspid tooth. Or, the lingual arch retainer can be used for further rotating the molar by adjusting the spring. I sometimes put it on for the purpose of rotating the molar, and at the same time use it as anchorage for moving other teeth.

It has been suggested that it is objectionable to attach directly to the screw of the clamp band. There are some objections to that, and when you find it objectionable the band can be reversed and the lingual arch attached to the opposite end of the screw. Many times you will want to reverse the clamp band anyway, and allow the screw portion to extend back beyond the second molars to keep the second molars expanded.

The lingual arch which is to be attached to the clamp or plain bands, should be made very accurately, and if not sufficiently skilled to solder them properly, you may put them on a plaster model made for the purpose.

In the case suggested by Dr. Rogers, if the incisors have been lengthened or depressed in their sockets they might cause sufficient strain on the lingual arch to tip the molar, because you have the retractive force of the incisors exerted on the molars, with a long lever: so re-enforce with some attachment to the bicuspid or cuspids: use a hook over the arch attached to the tooth, for instance.

I feel thankful to Dr. Lourie for the ideas he has

Dr. E. H. Bogue. promulgated. I also wish to make due acknowledgments for one other feature of this meeting, which is that each speaker seems to feel himself absolutely free to criticize the essayist as his production is under discussion; so that when Dr. Pullen showed us what he did, it was with great delight I heard the questions asked and his answers. I want to offer him my compliments for showing

us what he acknowledges was, at least, a partial failure. It is not every fellow that has the courage to do that.

Dr. Pullen left two or three things to be asked, I think. Why does he not, in the cases he shows, push all his teeth out to their proper places in the arches?

I would also like to ask Dr. Pullen why he retains teeth in positions he does not want them to occupy? I refer to the case in which he said the fixtures made it look as though the laterals were too far lingually.

Dr. Hawley, in showing us how to plot a dental arch from the measurement of one, two, or three teeth, has but adapted himself to the conditions of nature, and when he and Dr. Young agree that the temporary molar teeth are just the size of the permanent ones which are to replace them—I have no doubt they are correct. At the same time I should feel like doing what Dr. Rogers said we must do: “we must take our patients before the temporary teeth are all lost.” I think he is quite correct: but how are we to get them? Every now and then a sixteen to twenty year old patient comes along, and inquires, “Am I too late?” Dr. Ainsworth says he has done something for patients up to the age of 48 or 49 years, and now I believe Dr. Baker speaks of a case wherein the patient was 62! It is of the greatest importance, as I see it, that we should undertake these cases long before the permanent teeth are in place, so that the attachment or adjustment of fixtures may be attended to without danger of injury to the permanent teeth. I prefer the use of bands, ligatures, etc., upon the deciduous teeth to their application to the permanent ones.

I can not see why Dr. Hawley’s plan will not admit of sufficient enlargement of the temporary row too, because the same force which operates *in utero* for the formation of the upper jaw, will operate afterward to reduce the jaw if it is too large.

Dr. J. Smith Dodge asked many years ago how long should a tooth which has been moved from malposition, be retained? Dr. Ottolengui undertook to answer that question, but he was jesting. I hoped he might say that the teeth should be kept there until the entire occlusion was restored. In fact the worst teeth to get out of order are the six lower front teeth: if these are kept right and proper articulation is had with reference to the others, bicuspid and molars, they will stay.

I have been much pleased with this discussion,
Dr. Pullen. because it has brought up so many valuable points in our every-day practice. Retention is one of our most difficult fields, and we have much to learn, and it will take years to discover all there is to know about it.

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I must agree with those who have spoken of over-expansion of the arches. It is our common procedure to move the teeth further than we want them. Another thing, we must give Nature a chance for development, in our retention. In many instances we are not through with our cases at retention: not for years afterward, although we may receive our fee when the retaining appliance is put on.

One case Dr. Bogue mentioned, if you will remember, where the upper lateral incisors were in lingual occlusion and were moved into position. I moved those teeth out. The retention afterward was simply to hold through a developmental stage. That particular case needs more work done on it after a certain period of development. I have held it now eight months. It is not a finished case, but there has been development, and it is one of the most interesting cases I have ever undertaken. The watching during that period of that development of the process and anterior part of the arch, has been most interesting. Another thing Dr. Bogue mentioned, to which I referred: How long should the teeth be retained? The occlusion is important always, as we all know. I would limit the influence that occlusion would have in those cases, to simple cases and to special cases, because we do not believe that in extreme cases the occlusion would ever hold them unless they are first retained a very long time. If retained until the inclined planes are in correct position, you might succeed.

I would like to compliment Dr. Lourie on the points he brought out in connection with the lingual arch. With its use I have enjoyed the retention of Class II and III cases better than ever before. The points he brought out this morning are just the ones we need in our every-day work: to know how to overcome the difficulties that are coming up all the time in connection with the lingual arch.

I was pleased to have Dr. Hawley, who has spent much time and study on measurements of the normal arch, bring out the points he did as to the space occupied by the deciduous cuspids and molars being sufficient for the permanent teeth.





The Retention of Teeth in the Jaws.

By A. W. HARLAN, M.D., D.D.S., New York.

Read before the Central Dental Association, January, 1907.

It goes without saying that the first duty of a dentist is to prevent disease of the soft tissues of the mouth, and prevent the loss of teeth by repairing them when carious, or when they are damaged by accident.

It is not my intention to speak to-night about the filling of teeth, by inlays, or metal fillings, nor is it my wish to enter into the details of uniting teeth by the use of bridges or bars set into teeth, but I intend to speak of the retention of teeth in the jaws by the practice of conservative operative dental surgery.

The Arthur System Condemned.

The most fascinating branch of dental surgery to me is that phase of practice which permits of the use of finely tempered delicate instruments within and around the roots of teeth. I was early impressed with the imperative necessity of possessing instruments suited to operating within the roots and around them. When the Arthur System of prevention of decay of teeth was first published, I was opposed to it, and have been to this day. The disks and cones which came with that system have caused more disease of the gums than almost any other agency (misapplied by the dental engine) in practice during the years from 1872 to 1890.

There are many persons now living whose teeth were mutilated and misused during these few years, by disks and cone-shaped steel and corundum points, to their sorrow since their teeth were operated upon.

Diagnostic Examination.

In a diagnosis, it is my invariable rule to examine every tooth; first for vitality, second for caries, third for deposits on the roots, and fourth to note the number of teeth in the jaws.

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Teeth are to be considered as a whole, for purpose of use, but they are to be treated singly, in order to maintain them in a state suitable for retention in the jaws.

To retain teeth in the jaws during life is a difficult task. If it were not, there would not be such a demand for special dental knowledge. This necessity is growing faster than the supply of men especially instructed and educated, and in consequence there are many toothless persons now, where there should be only a few per thousand.

Every day I see middle-aged people, and even those under middle age, with teeth lost which might have been saved by the intelligent practice of conservative dental surgery.

By the aid of electricity, we can see through the teeth and jaws with such ease that there is no longer an excuse for having flattened and nodulated deposits on the roots or between them. We can even determine when the bony sockets are carious or necrotic, or when there are growths upon the roots or within them, or growths over the apices of roots. In a short period any dental surgeon may so acquaint himself with the variations from health of the gums, normal to abnormal, that his services will be invaluable. Every portion of the neck of a tooth and its root must be examined with delicate probes, fine parafined silk and the electric light to ascertain the exact conditions.

The fingers must be trained so that the most delicate operations may be performed upon the roots, as nearly in the field of vision as possible. Compressed air is always an aid in keeping the field of operation clear of blood and debris. When teeth are sensitive to touch, a course of massage with magnesia or soda for a short period (two weeks) is always advisable.

Modes of Treatment Suggested.

The malocclusions of teeth must be corrected by grinding, and teeth which have no antagonists must be provided with them or they will be lost. No pocket or pouch alongside a root must be left to be filled with food or other foreign matter; it must be cut or scraped out or burnt, so that the tooth can be kept clean.

It is better to have the gum fit closely around the neck of a tooth, even though it only covers one-half of it, than to leave a place to be filled with decayed and decaying matter.

All the teeth that are filled by inlaying or filling, should be contoured to protect the interproximal gum tissue. There are no exceptions to this rule. All crowns and abutments should be so fitted that the interproximal space should not be impinged upon, otherwise even in a short period there will be developed pockets for the further destruction of the periosteum. These are so difficult to treat, after they are once developed, that the

integrity of the gum tissue may be impaired to such a degree that it never becomes normal again.

Erosions of the teeth and abrasions of the ends of teeth are treated mechanically or by the administration of drugs, which may correct or modify the secretions. Poisons collecting in the alimentary tract through lack of ingestion of a sufficient quantity of pure water are to be treated by flushing the system with water and eliminating smoked and pickled meats and fish from the diet.

The greatest care on the part of the dental surgeon will not retain the teeth in the mouth of a patient without a full co-operation of the patient himself.

The teeth must be kept clean, even if you must see them every week or every month. This is a matter of training. The mere rinsing of the mouth once or twice per day with any kind of a mouth wash will not keep the teeth clean. They must be scrubbed and rubbed and rinsed as carefully as the hands are washed. The interspaces must be cleaned and kept free from food.

Any person who is a mouth-breather, desiring to keep his teeth, must have his nose opened, so that the air will be taken in and expelled through that organ.

In attempting to retain the teeth in the jaws, you must take a real personal interest in the matter. All teeth having abscesses, blind or otherwise, must be so treated that they will give the minimum of discomfort to their owners. If it is a necessity to amputate a portion of a root, do it. Conservatism here is needed, as many teeth are lost in a short period by pathological processes.

**Use of the
Blue Light.**

I have no new theory to offer you to-night with reference to treatment of morbid conditions of the gums, but I will say this: I have been able to disperse thickened areas of gum tissue about the ends and over the sides of the roots of teeth, pulpless teeth, by the use of the concentrated blue light. In these cases an exposure of from two to five minutes daily has been all that they required. I hold the lamp within from one-quarter to one-half inch from the gum, always having the room darkened. If the heat is too intense, I suspend operations for a minute or two and resume.

The most rigid cleanliness that I can obtain is maintained during the treatments and in the intervals. As a preliminary to these treatments, when there are pockets alongside the roots, I wash out all the debris and inject them with a solution of:

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R Alumnaol	gr. viij
Oil Betula	min. iij
Distilled Water	min. xc

I place a cotton roll inside and outside the arch, and let the medicine stay in the pocket one or two minutes. The next day I use the blue light, and so on daily for two weeks, or longer, if necessary.

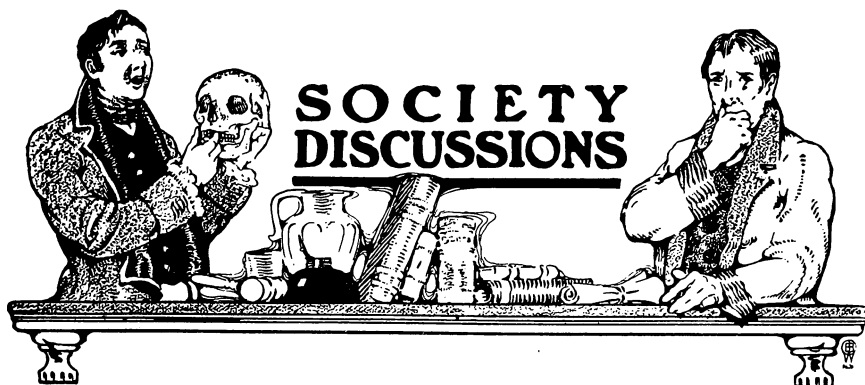
Value of Oral Hygiene.

Loose teeth can be retained in the jaws for long periods if the hygiene of the mouth is good and the teeth are fastened to each other so that there will not be too much movement in their sockets.

All teeth that are lame and sore to the touch must be restored to health by operations, usually within the roots, and after they are filled, by further massage of the gums and exercise. Nearly all teeth not being exercised are useless.

Teeth can not be retained in the jaws for a long period if there are pieces of roots adjacent to them periodically inflamed and infected. Mal-formed teeth, not exercised, should be extracted for the benefit of those remaining in the mouth. If the roots of teeth are made clean above and below the gum line, and all foreign matter is removed by a strong syringe and compressed air, I deem it good practice to thoroughly irrigate the interior of the pockets and pouches by using a ten per cent. solution of mono-chloracetic acid in each pocket.

I always use fine twilled silk between the teeth, to detect any ragged or rough deposits on the sides of the roots, drawing it gently, and as high as the gum will permit, and pulling it down slowly, so that some portions of the silk will be obstructed if anything remains on the root. It does not matter how much time you spend on the teeth, if you do not remove all deposits on the roots the gums will not become reattached, nor will they become normal in appearance. They will bleed, and a nest for microbes is established for the production of pus. I regard the integrity of the gums as the first requisite in retention of teeth in the jaws, and the maintenance of the mucous membrane of the mouth, nose and pharynx as next in importance. Every man must choose for himself the rules for beginning operations on the teeth or gums and try to put himself in the position of the patient. All of the books and periodicals necessary to learn the views of others should be studied and digested to the end that the latest discoveries in science and surgery may be utilized to make prophylaxis real, not a fad.



Second District Dental Society.

A regular meeting of the Second District Dental Society was held in Medical Library Hall, Bedford Avenue, in the Borough of Brooklyn, on Monday evening, October 8, 1906.

The meeting was called to order at 8.30 o'clock p. m. by the president, Dr. Ash.

The secretary read the minutes of the last meeting, and on motion, duly seconded, they were approved as read.

President Ash then read the following address:

President's Address.

Fellow members of the Second District Society:

I appreciate the honor of being your president and assure you that I shall keep my best energies on tap for the good of the society.

As we meet together on this, our thirty-eighth anniversary, we must feel that we have much to be thankful for, recalling as we do, the terrible disaster which occurred to our fellow dentists in San Francisco. We will never know what hardships they have endured and will endure; but we have the satisfaction of knowing that the dental fund, which helped to relieve some of their sufferings, was started within the membership of the Second District. The hearty response with which that appeal was met is evidence of the feeling of fraternalism which is rapidly taking root in our profession.

Our society has had a very successful year in every way, the circle of our membership being unbroken, except as we have opened to receive new members.

But if our society is to progress, we must look forward to a still more prosperous year. Progress can best be achieved by unity of action; and it

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should not be necessary to urge any one to share in the work, for this is *your* society as much as it is any one's else.

Your executive committee has prepared an interesting and instructive program for the winter ; but we need more than that to be successful. There may be ever so eloquent a speaker for the evening, but if he has no one to talk to, the meeting *must* be a dismal failure. It behooves you, therefore, gentlemen of the Second District, to regularly attend the meetings of the society.

Some men say, "Why, I can stay at home and read all the papers after they are published." Yes ; but you do not. You subscribe to the dental journals? Surely ; but how much of them do you read? Just those articles which catch your eye as you "run over the pages." Do you set apart one or two evenings each month to read dental magazines? Do you? If you do, you are the same men who set apart certain other nights of each month to attend *dental* meetings.

**Encouragement
of Young
Graduates.** Gentlemen, the society *needs you*, but not more than *you* need the *society*. Our membership is not increasing as rapidly as it should, considering the number of new graduates who come within our territory each year. There

should be a committee for the purpose of getting after these men and bringing them into the society. Such a committee could keep informed through the Register's office of each county of the name and address of every man who registers each month, and should see those new men and bring them right in. I would be in favor of charging no initiation fee to the men who apply for membership within one year of their graduation. The result of this would be that nearly every young graduate who came among us would join the society (especially if invited to do so), and would thus get started right ; and a right start means much toward keeping a man up to ethical standards.

**Fraternal
Relations.** There are men in our society who have been members for years and who still do not know each others names. This should not be, and I propose this year that in order to assist in overcoming this condition, a person on taking the floor shall announce his name, to be repeated by the chairman of the meeting. This will help us to learn the names ; but we should know each other, and it is the duty of the older members of ten, twenty or thirty years' standing to greet the younger men and make them feel at home.

Is this too much trouble? It should not be. You, too, were a beginner once, and I would beg of you not to let your accumulated wisdom cause you to forget the time when you were grateful to some older practitioner

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for a practical suggestion as to some little method which he had used successfully for years, and which, if you even heard of it in your college lectures, you could not recall, with the mass of knowledge which one is supposed to absorb in three years.

Let us have our hand always ready, not for the petty "graft" which is so commonly sought, but for the purpose of helping our fellow dentist, and thereby let us make life worth the living.

The purpose of our society is the advancement of our profession. How much have you done to advance it? Are you like a sponge, absorbing everything and giving up nothing, unless it is squeezed out? Or are you like the sun's rays, absorbing the moisture from one place, only to give it back again where it will do the most good? Give it up, I say! It is not yours, anyway. You have merely the right to use it, but no right to monopolize it. It is yours only by the grace of our predecessors. Take from your practice what they have given you and there would not be enough left to make a respectable shadow.

We should never let pass an opportunity to show our gratitude to our predecessors for what they have done for us, and should never lose a chance to show our appreciation. In this connection there are one or two matters to which I wish to call your attention.

Kingsley's Bust of Christ.

Dr. Norman W. Kingsley was one of the greatest artists our profession ever saw, and it was always his endeavor to instil into the minds of his fellow dentists that dentistry should be studied as an *art*.

His artistic endeavors were not confined to dentistry, as many of you know who have seen his wonderful work. One of the most beautiful pieces he ever did was a life-size marble bust of the Christ. If you stand and gaze attentively at the face for a few minutes, the cold marble seems imbued with life. There is a movement on foot for the purchase, by the dental profession, of this extremely valuable piece, that it may be preserved in one of our galleries. When the matter is presented to you, as it will be in the near future, I bespeak for it your hearty co-operation.

The Jarvie Banquet.

Another matter of which I wish to speak is the retirement from practice of our dear friend, Dr. William Jarvie. Few societies are honored by having a member who can stand with Dr. Jarvie in the general esteem which he has won and the many high honors to which he has attained; and it seems a fitting time to show our appreciation by tendering him a complimentary banquet. A number of members of this society had decided that such a banquet should be held; but Dr. Jarvie has so many friends in the profession outside of our society that it is a foregone conclusion that many others would think the same.

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Your president and executive committee, feeling that the privilege of organizing such a banquet should be with our society, thought it necessary to act at once, and have taken the preliminary steps, feeling assured that the matter would have your hearty approval.

There are many things which might have been incorporated in this address: A plea for the best use of the new energies which have been stored up during the vacation period; our ambition to achieve the painless operation and the ideal filling; the progress of dental education, and many other things. But what I wanted to do was simply to point out the one or two vital things which will make for the success of our organization. Put away the little hammers. Stop "knocking" your neighbor because an occasional piece of his work is not up to par. You, too, have put in pieces of work of which you are not entirely proud. In a nutshell, then, be charitable and get together and our success is assured.

The essayist of the evening, Dr. I. J. Wetherbee, of Boston, then read a paper entitled "The Passing of the All-cohesive Gold Filling."

The Passing of the All-cohesive Gold Filling.

The subject of this brief paper is the "Passing of the All-cohesive Gold Filling."

That the "all-cohesive gold filling" is rapidly being eliminated from practice I believe generally to be accepted as a fact. It might be well to say here that by the term "all-cohesive gold" is meant the class of fillings constructed entirely of cohesive gold, whether or not annealed, just prior to use; in the latter case it is referred to as non-cohesive foil, our understanding of this term non-cohesive being that the gold is made absolutely non-cohesive by a process which renders futile any attempt to restore the property of cohesion by subsequent annealing.

A variety of reasons, no doubt, are responsible for the greatly diminished number of all-cohesive gold restorations; there has been the extensive substitution of the plastics (amalgams and cements) in the fields held formerly to belong in a great part to cohesive gold. Though calling for a lesser degree of skill in their manipulation, yet there can be little doubt of the great service they have rendered to operative dentistry.

I will also mention the introduction of the porcelain inlay, in which has been wrought such a wonderful advance in the past few years, that it may be said to have completely superseded gold restoration where its exposure to sight is in the least objectionable. Of more recent date is the appearance of the gold inlay, which has still further restricted the field for cohesive gold operations.

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The general acceptance of these new methods leads me to ask what is to-day the position of the progressive members of the profession toward cohesive gold. Has it or has it not any further sphere of usefulness? Without hesitation I answer this question in the affirmative. I claim for it certain advantages in combination with tin, which to my mind the above-mentioned methods do not possess, the class of cases referred to being the so-termed compound cavities of the bicuspid and molars.

It is in regard to these cavities that I wish to present to you a few facts on the combination of tin and gold. This combination has been known as the "Shumway Method." I do not know whether you have seen Dr. Shumway's treatment here in New York. Unfortunately, he is not with us to-night and is not now in active practice, as he has had a stroke of paralysis. I will describe the method briefly, and then I will have you take the specimens that I have brought here and examine them. One of them is a filling by Dr. Shumway that was put in about eight years ago, which shows this remarkable affinity between tin and gold. There is very little cutting of the tooth structure; in fact, there are no undercuts of any kind under his system. I have gone ahead and used the groove to secure the cohesive gold. About three-fourths of the entire filling consists of tin. There is an inner layer of from six to twelve thicknesses of foil to prevent the showing of the tin in the teeth. On this matrix the tin is forced. It is condensed by the heated point of a plugger, and it is remarkable the degree of hardness you can obtain by that method. In fact, after a filling of this kind has been in for several years, if you undertake to remove it or have occasion to cut into it, you find the surface very hard.

A Member.

I would like to ask Dr. Wetherbee what kind of tin he uses and in what form?

Dr. Wetherbee.

The tin used is a No. 4 foil, any of the different makes. The trouble in all, or a great many, of the tin operations, is that the tin is not chemically pure, and it has frequently been attempted to use tin without the rubber dam. It must be operated in a dry field, or it is absolutely sure to not succeed. No. 4 chemically pure tin is the kind I use. It is foil-folded down to narrow shape or stripes.

Discussion.

Dr. Ottolengui.

I take partial exception to one statement made. I am afraid that the essayist's statement must be taken with some allowance, where he says that the all-cohesive gold filling is passing away, or that it is passing quite in the way the essayist has set forth. For example, he pointed out that the por-

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celain inlay is displacing gold, and now that the gold inlay has come, the gold inlay is displacing the cohesive filling to some extent. I prophesy that in those places where cohesive gold now ought to be used, if you use porcelain or gold, you will have failure. I think that the inlay of either porcelain or gold has displaced something else than gold. I believe that the principal place for porcelain is where originally we used plastics, where we were afraid to put a metal filling because the pulp was so nearly exposed. It does not displace gold in those localities—that is, where the inlay of porcelain is used. It does, of course, displace gold from the standpoint of cosmetics, but that is largely in the front of the mouth. When we come to the gold inlay, it seems to me that we displace amalgam instead of gold. If you could put a good gold filling in, there is really no excuse for putting a gold inlay in; but where you can not put a good cohesive gold filling in and have heretofore been using amalgam, then the gold inlay is a great deal better than an amalgam filling. But there are only a few instances, comparatively speaking, where it is excusable to put in a gold inlay in preference to a perfect gold filling, because I have yet to find a gold inlay that is as good as a gold filling.

I am a thorough convert to the inlay system. I
Dr. Van Woert. may be getting myself into a lot of trouble, but I believe this: that while the inlay system is not perfected by a long way, it is the coming method of filling teeth. I think there are a great many things that we have yet to learn about it before it will be perfected, if, indeed, it ever is; but even in its crude state I believe it is the means of saving many teeth that you cannot save with gold foil or amalgam or anything else. Dr. Ottolengui says that an amalgam filling, as I understand him, is not as good as an inlay. Is that right?

Dr. Ottolengui. That is correct.

Well, I disagree with you. I think that a perfectly inserted amalgam filling has yet to be improved on. And I believe another thing, that there is no material used in the dental profession that is so universally abused. Now I am not decrying gold; I am not attacking the principles that have made American dentistry what it is to-day, but I do believe that if amalgam were used with the same degree of skill as gold, it is one of the very best things to preserve the teeth. (Applause.)

A number of years ago—ten or fifteen or twenty—Dr. Ottolengui and I went to Boston, and both of us demonstrated inserting amalgam and cement. Great exception was taken to it at that time; everybody said it was the worst thing we could possibly do. Now, gentlemen, we are coming right back to that in what we are doing to-day in all our inlay work. If you prepare the cavity properly, if you insert the cement properly and

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burnish the amalgam properly, you certainly can not say that the amalgam filling is not better than one inserted without cement. I do not believe you will ever have a failure.

Now, why do inlays, as we put them in to-day, succeed where other things fail? Simply because we have the cement. What is the inlay? Nothing more nor less than the cover to the box; that's all it is, and you are depending upon cement for the maintenance of the weak wall of the tooth, and your amalgam is the cover which protects it from disintegration.

The President.

We are all very glad to have heard Dr. Van Woert's remarks. Now I want to ask him if he has anything to say about tin and gold.

Dr. Van Woert.

My experience in that line has been so limited that I have no right to say anything about it. Fifteen or twenty years ago I was very much interested in Dr. Canaday's work, in Albany, and I thought it was very beautiful, but I never was able to get similar results. I was never able to combine tin and gold as successfully as to fill with tin or gold alone. I have seen some most beautiful operations performed by Dr. Canaday years ago. But as an operation for the general practitioner, I do not believe that the average man has the skill to combine the two and obtain the same results that he can with other materials. What we want is something that every man in the profession can get results from, and I do not believe that there are ten per cent. of the men who are present here to-night, or indeed, in the whole city of Greater New York, who can combine tin and gold and get results from it, and good results such as Dr. Canaday or our essayist of this evening. I wish I might.

Dr. Houghton.

I would like to ask what virtue a gold and tin lined filling has in preference to an amalgam cement lined filling, I would like to inquire, I say, what virtue over a cement lined cavity has a tin lined cavity?

Dr. Wetherbee.

I am glad to have you bring that question up, that question of amalgam and gold. It is all in the skill you possess, operating with amalgam. If you get a perfect adaptation of your amalgam, you get almost as good a result as you do with tin, but tin is absolutely non-conductive, and has been known for years as the best preservative of tooth structure. We have in Boston several men who are expert with cement and gold, and they can insert a filling of this description and get as good result as with tin and gold. It requires a much higher degree of manipulative skill to operate with tin and gold than it does with cement and gold. I think that tin and gold can be adapted to the manipulative skill of a majority of opera-

tors, whereas cohesive gold requires in some ways less skill, because if a man has less manipulative skill he can anchor cohesive gold.

Forty or fifty years ago, Mr. Chairman, my uncle
Dr. Houghton. used to fill cavities with tin, and I have seen him preserve teeth even where the tin was not condensed, and after removing those fillings, we found the cavities pretty black, but the dentine was perfectly preserved. I asked that question of Dr. Wetherbee, if there was anything in the virtue of gold and tin that he knew of, because I felt as though there was something in it in view of my experience in the early days.

Some hold that tin forms a chemical compound
Dr. Wetherbee. in the teeth that prevents the recurrence of decay; that there is a chemical composition formed by the oxide of the tin due to the saliva in the mouth. I do not adopt that theory. I think it is merely the adaptation of the tin, because, in my operation there is the non-cohesive gold which protects the teeth from the tin. It is but a short time ago that we had a paper from a number of doctors claiming that tin does not discolor the tooth structure. Your experience of forty years ago, was probably with the use of an impure tin foil.

I think there are a great many members of the
Dr. Cohen. society who remember that Dr. Darby demonstrated the tin operation; he used freshly filed tin, and he claimed that he got more cohesiveness in that form than in any other. He had no use for tin foil and used quite a great deal of force and sometimes used the mallet.

Do you find discoloration after a number of
Dr. Engle. years?

That is guarded against by using non-cohesive
Dr. Wetherbee. gold. A piece of that gold is taken and folded about four to eight times as a matrix, using from eight to sixteen layers against the axial wall and seat.

Do you ever find any change?
Dr. Engle.

I have never found any change.
Dr. Wetherbee.

You say you fill the cavity three-fourths with tin?
Dr. Engle.

Three-fourths to seven-eighths. Externally it is
Dr. Wetherbee. entirely filled with gold.

May I ask the time saved?
A Member.

I do not claim that it saves any time. It usually takes longer to put in tin and gold than it does an all gold filling. There are some cases where you can put in a tin and gold filling in less time than it will take you to put in an all-cohesive gold filling. But the idea of time and expense is not the question at all with me; it is a matter of adaptation and the service of tin.

The Same Member. I thought you claimed saving of time.

Dr. Wetherbee. No, I do not claim that. With an all tin filling you can save time.

Gentlemen, this is a very instructive paper of Dr. Wetherbee's. There are very few men here, I think, who know how to use tin, especially in combination with gold. It strikes me also that the men who are known as successful manipulators of tin, or a combination of tin and gold, are all men who are expert operators in other respects—that the men who have advocated this combination of tin and gold, are also expert operators of gold without tin. Really, Dr. Wetherbee, do you not consider that it requires more skill to use the combination of tin and gold?

I consider that any combination is more difficult than all-cohesive gold. Cohesive gold has been used for years; and now it is giving way as a filling material, to gold and porcelain inlays.

On motion, duly seconded, a vote of thanks was tendered to Dr. Wetherbee; after which, on motion, duly seconded, the meeting adjourned.

Central Dental Association of Northern New Jersey, Annual Meeting January, 1907.

The annual meeting of the Central Dental Association of Northern New Jersey was held at De Jianne's Hall, Central Avenue, Newark, N. J., on Monday evening, January 21, 1907.

The meeting was preceded by a banquet.

At the conclusion of the banquet the president, Dr. Joseph S. Vinson, introduced Dr. A. W. Harlan, of New York, as the essayist of the evening. Dr. Harlan read a paper entitled "The Retention of Teeth in the Jaws."

Discussion.

I thought at one time I knew how to clean teeth, but a year ago last summer, when I saw Dr. Harlan cleaning teeth at Asbury Park, it was quite a lesson to me, and any dentist who likes to clean a set of teeth and clean them well, would do well to see Dr. Harlan's clinic on his system of cleansing and particularly his instruments for removing tartar from the teeth. I also saw him use his blue light, and I think Dr. Harlan has demonstrated the success of the blue light.

I am very much interested in this paper, but Dr. S. C. G. Watkins, there is one point which it struck me the doctor should have put greater emphasis on: He speaks of retaining the teeth in the jaws, and then he only gives us his method of retaining them by the aid of cleanliness and massage. Now it seems to me that the chief cause of the loss of American teeth is their lack of use. If people would use their teeth as they should, I believe there would be very little pyorrhea. The people should use their teeth and keep them clean; use them; that is something that probably goes ahead of keeping them clean, because if they are used properly, the natural use of them will keep them clean. If the use of the arm will develop the muscle in the blacksmith or in any other mechanic, surely the use of the teeth will develop the tooth structure. It is simply massage, or gymnastic exercise, as you may term it, which the teeth require in order to bring healthy blood into them; you will thereby have a stronger structure and you will have stronger sockets. You do not see the old sea captain, who has been sailing all his life, having pyorrhea, but you see the surface of his teeth shining like a piece of polished ivory. On the other hand, we see pyorrhea attack the little pet poodle that the ladies pamper with prepared foods, for fear that a little bone may lodge in his throat and choke him. So also with the cat that has been petted and fed in an unnatural way, the same conditions exist; the cat will lose her teeth. On the other hand, look at the farm dog; who ever heard of a farm dog having decayed teeth or a bad breath? I do not think anyone ever heard of such a thing. But take the little dog three or four years old, that is cooped up in a flat, and he has bad breath because he is not fed right; he does not use those organs which are given to him for that special purpose. And if we can only educate our patients to such an extent that they would use their teeth in a proper way, we would have less to do with instruments; less chance to treat pyorrhea.

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Proper Use of a Proper Brush.

In the brushing of the teeth, I do not think we are half careful enough about instructing our patients how to brush their teeth. The brushing of the teeth is something which requires patience and some skill to brush them properly, and there isn't one patient in a hundred in any practice who brushes his or her teeth properly, and in that way the teeth are neglected and the gums are driven away from the teeth. Often by the very act of brushing, injury is done by irritating the gum, and perhaps allowing food to gather under the gums rather than brushing it away. Then, again, the proper kind of a tooth brush is not used. The ordinary tooth brush is practically useless for the brushing of the teeth; it is not made adaptable to the jaws, to the shape of the teeth, to the contour.

A Voice.

Won't you describe the proper tooth brush, Dr. Watkins?

Dr. Watkins.

That is a joke. If I really thought you were in earnest, I would be only too glad to do it.

The Same Voice.

I think that is a proper question. You said most of them were unfit for use.

Dr. Watkins.

I repeat that. In the first place, a tooth brush should be small; a four-rowed or large tooth brush is absolutely useless; it should be small, no more than three rows, and it should not be too long; the bristles should run crosswise; the brush should be so made as to take the contour of the jaw or teeth; it should have a projection or a lump on the end, so as to get around back of the wisdom teeth and the inner surface of the lower and upper teeth, with a proper kind of a handle, so that one place in the mouth could be cleaned exactly as every other place.

Dr. Sutphen.

Mr. President, as I have thought over the subject of the evening, my thoughts have certainly wandered very far from the paper as presented; at the same time, I feel very much gratified that the paper is as it is, and not as I expected it to be. I consider, as the paper laid emphasis, that our function as dentists is to preserve the length of life of the teeth, and I think too little attention is paid to that very subject. For a number of years I have spent two months away from my office in summer, and in the course of the winter, as my patients come back, there has not been a year but that I have felt heartsick sometimes to have one, two or three of my patients come to me reporting suffering while I was away, and that the relief they received had been by extraction; it made me heartsick to think that those teeth should be lost. Why? Because women do not recognize the value of a single tooth; to them the simplest way is

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to have a troublesome tooth extracted. Of course, we all hear less complaint when we take out a tooth giving trouble, and do not take the pains and time necessary to preserve that tooth, and thereby make it comfortable for years and years to come. I was also much pleased with the way our essayist presented his method of examination. I think a great many of us are very superficial in our examination of teeth; we do not think it essential to examine more than the surface of the teeth. How many of us use the electric light in the examination of teeth, and yet by its use we can see things which no probe will bring to our notice; which the eye, unassisted by light, will not detect. Many conditions in the mouth are brought to our attention by the use of light which otherwise would escape us, only to come back months after to give us and the patient very much trouble, whereas a few moments utilized in a proper manner would relieve both the patient and the operator of all serious results. I thoroughly agree with the statement that teeth that are not used should have something made to protect them, so that they could be kept in comfort in the mouth. I think too little attention is paid to that. As far as cleaning the teeth is concerned, it is not a simple operation, and yet how many are there of us who take five or ten minutes to clean a set of teeth? Who can clean teeth in five or ten minutes? Too many of us are not willing to give the time. Pyorrhea is on the increase, and are we not responsible for some of it? Do we do our duty to our patients when we only superficially examine their teeth and when we allow these deposits to crowd the gums, all because it takes a little time and skill, which we are not willing to take or master, in order to thoroughly remove those deposits?

I would like to say that Dr. Harlan little knows
Dr. Fisher. how closely I watched him the first year I was associated with him, and I can certainly say, in testimony of what Dr. Harlan has done, that I never have seen any more beautiful work than I saw that year. Since that time, especially within the last year, I have not had the time, but any special work that Dr. Harlan has designed, he has had the kindness to let me see, and I must say that cases that I certainly would never have cared to undertake, I have seen him pull through; and if a case has gone to such an extent that he thinks he can not possibly save it with the ordinary mechanical appliances, he will conceive an efficient mechanical appliance; and that is where his accomplishment comes in. Dr. Watkins said something that we all agree with. Non-use of the teeth is no doubt greatly responsible for pyorrheal conditions. But I believe Dr. Watkins went a little too far when he asked who has ever seen a sea captain suffer with pyorrhea. In the same manner allow me to include the old soldier. During my

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three years experience in the army I paid particular attention looking after pyorrhea, especially after having met Dr. Harlan in the very first few months of that period in the army, and I must say that I found pyorrhea to be prevalent to a greater extent than I would like to admit among the soldiers, who had very coarse fare. So that rule will not work out. The army man has to use his teeth and jaws. So really the non-use of the teeth is not going to extend pyorrhea.

Each man reading a paper takes certain points to himself, those points which come within his province in the practice of dentistry. As I listened to the reading of Dr. Harlan's paper, there came back to me the thought of my preceptor, who instilled into me that I must never take out a tooth if I could possibly save it or patch it up in any way. I think he was about twenty years ahead of the profession at that time; he realized the importance of saving the teeth of women. Another one was Dr. Cushing, who made the remark that dentists made magnificent contours and left the necks of teeth like a sewer. Another man was Dr. Barry, who time and time again tried to impress upon the younger members of the profession the importance of saving the teeth, patching them up, not extracting them, even if they did have pyorrhea, even if they were broken down. The fourth man was Dr. Harlan. Another point I want to bring out is from the selfish side. When patients come to us, we naturally expect to fill their teeth where there are cavities, or make artificial teeth, when needed. If we can so educate our patients that they will come to us regularly to have their teeth and gums treated, and impress upon them the idea that our object is to save the teeth and gums in a good healthy condition, do you not see that we add to our practice? Dr. Watkins spoke of seafaring men as not having pyorrhea. I will mention one exception to the general rule; a man who came to me, a seafaring man, about forty years old, who had pyorrhea in a very serious form. I met him accidentally, and got talking to him. He told me about his teeth, and coming to inquire into it more closely, he told me that he had been living on salt fish, and afterward, reading the account of some German scientist, he had made a study of that, and he found that leprosy was caused by the eating of salt fish as a food; so I made up my mind that with the muscular outdoor life he led and the plain simple food he ate, his pyorrhea was due to eating salt fish, and I asked him to stop that and write to me what the result was, but he has never done it. I suppose the writing of letters is a very serious piece of work for a seafaring man.

In line with Dr. Harlan's paper of to-night, a most interesting case was presented to my notice in my practice on Saturday. I have thought of it a

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good deal since, and I think it will interest you all. A gentleman between seventy and seventy-five years of age, of education, an M.D., who graduated many years ago, but who is now and has been for many years engaged in other work in New York City, came to me for some new teeth on account of shrinkage of his gums. On taking out his teeth, he remarked: "You remember that lower plate, doctor, used to have lots of tartar on it?" I said, "Yes, a large portion of it right in front. Where is it?" He said, "I have been taking a medicine for a month or two for a urinary trouble. I am subject to uric acid accumulations and some inflammatory condition of the bladder, but I have noticed since I have been taking this medicine that the incrustation has been gradually disappearing, until now it is entirely gone." I said, "That is interesting; that is what dentists have been looking for for many years; if it will remove tartar from that plate, it will remove it from natural teeth, and tartar we have discovered to be one of the prolific causes of pyorrhea." I asked him what the medicine was, and he said it was eurotrophine. He told me some of the ingredients. I asked him if it was in the United States Pharmacopœia, and he said, "I have not looked it up, but it is in the German and French Pharmacopœia." I said, "Would it have injurious effects supposing that one was not afflicted with urinary troubles, as you are, in the administration of it?" And he said, "I do not think it would; it is a solvent of those ingredients of which this tartar is mostly made up." Now, gentlemen, it seems to me that this is one of the most important things that I have heard of in this connection, and I think it is worthy the attention of every one here to investigate and follow up, and if it will do for others what it has certainly done for this gentleman, I think we are nearer a solution of our pyorrhea troubles than we have been at any other time.

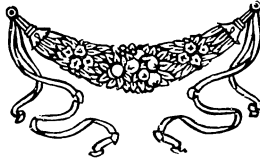
In our practice there are cases of pyorrhea in various stages where the teeth get loose enough to be pulled out. I would like to have Dr. Harlan state if he would extract such teeth.

Mr. President and gentlemen: I do not wish to take up much more time, and I will not. Dr. Luckey, in opening the discussion on my paper on food and its relation to the teeth and their sockets, at Asbury Park, said that there was a good deal of quotation and not very much of Harlan. Dr. Watkins, who was not present, I believe, at that meeting, perhaps does not indorse the stress I laid upon the absolute necessity of thorough mastication. I quoted everything from the Koran to the work of Professor Chittenden at Yale College with reference to the value of foods, and I quoted myself with reference to the absolute necessity of

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using foods that must be masticated. By some chance the *Scientific American* republished that paper and gave fame to the New Jersey State Dental Society, because every advertising agency in the United States for the past few months has been sending me copies of that paper which was read before your society. So it seems that the people of the country will get the benefit of all the authorities there quoted and what I had to say myself as to the necessity of mastication in order to keep the teeth in the jaws.

Dr. Harlan then proceeded to answer in technical language the questions that had been asked him concerning the subject of his paper, and at the conclusion of his remarks was tendered a vote of thanks.





The Jamestown Dental Convention.

Many dental meetings in the past have proven to be great in name only. From present indications the one to occur at Jamestown promises to reverse this order; announced as a Convention there is every indication that it will eclipse many Congresses. The Committee on Organization wisely eliminated the section method and thus made great and enthusiastic sessions assured by limiting the number of essayists, and arranging that all papers should be read before the entire convention. Of the four essayists chosen the chief of course will be Prof. W. D. Miller of Berlin; the others will deal with vital practical topics. Two special features will be the clinics and the professional exhibits, besides which there will be elaborate displays by manufacturers and dealers.

The Clinic Committee is headed by Dr. Clarence

Clinics.

J. Grieves, with five prominent men as assistants, and in addition a special Clinical Chairman in each State in the Union. Thus it is evident that the very best talent in the country will certainly be secured, and the clinical demonstrations should alone repay any man for a trip to Norfolk even though he come from the farthest corner of the continent.

**Professional
Exhibits.**

Several important professional exhibits have been secured. The American Society of Orthodontists has loaned its great collection of Orthodontia casts, first shown at the St. Louis Congress. This exhibit will be in the care of Dr. H. E. Kelsey, who also has the promise of several private collections which will be shown and explained by distinguished orthodontia specialists.

The Committee on History, Dr. Wm. H. Trueman, chairman, and Dr. Charles McManus, secretary, will display a magnificent collection of ancient dental instruments, apparatus, prosthetic and operative work, books, and photographs.

Dr. Wm. H. Bebb, of Los Angeles, chairman of the Committee on Comparative Anatomy, will exhibit his personal collection of over three thousand specimens, one of the rarest in the world.

Dr. Richard Grady, dental surgeon of the United States Naval Academy at Annapolis, will exhibit several thousand charts of the mouths of midshipmen showing original conditions and results of treatment.

Dr. John S. Marshall, Chief Dental Surgeon in the Army, will have charge of the Army Dental Corps exhibit.

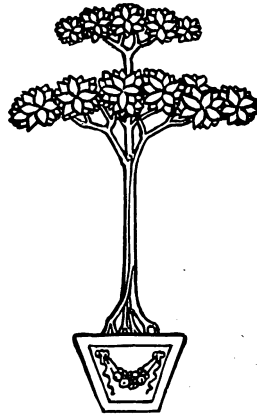
**Membership
and Hotel
Accommodations.**

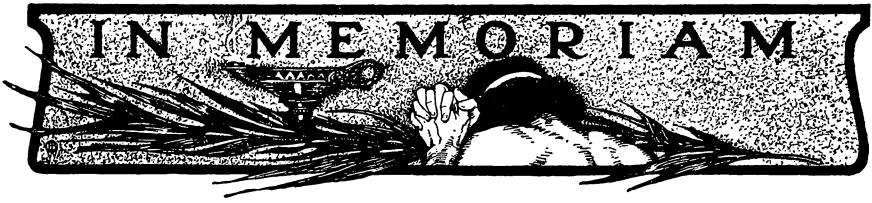
Dr. F. W. Stiff, 600 E. Grace Street, Richmond, Va., chairman of the Membership Committee, reports applications for membership rapidly accumulating. Membership fee is to be five dollars, which will entitle each member to a bound copy of the proceedings. Bona fide dental students, who forward certificates signed by their college deans, will be accepted as members at half the regular fee.

Hotel headquarters will be at the Inside Inn where reasonable rates and excellent accommodations have been secured. The Inside Inn generously offers numerous halls and committee rooms free for fraternities, alumni associations, etc., who are invited to hold meetings at this time.

Our Special Porcelain Papers.

In the last number we quietly began what we may confidently announce as the most important series of papers dealing with the subject of Ceramic Dental Art yet attempted. We have been planning this enterprise for over a year and have only delayed publication until all details could be so perfected that the continuous appearance of the papers could be assured. Various phases of the subject have been allotted to men who are not only experts in the art, but likewise skilled writers. Part First will deal with the filling of teeth with porcelain, and a particular feature will be the perfection of the illustrations of cavity preparations. To this end a splendid set of plaster models of teeth, of large size, have been obtained and every cavity described will be carefully cut in a model, and then photographed for reproduction. The author, Dr. John Quincy Byram, needs no laudatory introduction, his reputation as a porcelain specialist and prosthetic teacher being international.





Dr J. Hall Moore.

Died at Richmond, Va., Dec. 28, 1906, of heart failure, J. Hall Moore, M.D., in his seventy-fifth year.

Dr. Moore was the son of James Moore, who came from the north of Ireland in 1800, and was one of the first settlers of Washington, D. C., at which place Dr. Moore was born in 1832. Dr. Moore studied dentistry for five years with Drs. Luther Parmele and William Malster, and in 1853 began the practice of his profession.

His medical education was received at Georgetown University. While holding a position in the U. S. Treasury Department, he employed his leisure hours in the practice of dentistry. Dr. Moore moved his residence to Richmond in 1861. He practiced dentistry as opportunity presented, yet much of his time during those four trying years was spent in field and hospital work. Resuming his office duties after the close of the war, he soon became one of the leading practitioners of the city, his clientele being composed of the leading citizens. Being deeply interested in his profession, he was among the first to participate in everything that looked to the elevation of dentistry. In the State Dental Association he was one of the leading spirits, serving three successive terms as president. In the making and framing of the dental law in the State he was an active participant, and after the passage of the law served ten years as president of the State Board of Dental Examiners. For six years he held the position of professor of clinical surgery in the dental department of the Medical College of Virginia and for four years chairman of the dental faculty.

While thus engaged in all the activities of life, chief and uppermost with him was the obligation that he was his brother's keeper, and by his godly life and conversation he stood forth as a living epistle, known and read of all men. By his good works and deeds many will at the last day rise up and call him "blessed."

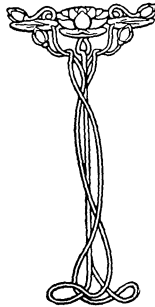
The Richmond City Dental Society, at a meeting called for the purpose, passed the following resolutions:

ITEMS OF INTEREST

"Resolved, That in the removal of Dr. Moore we have indeed lost the companionship of a true and loyal friend, the counsel and advice of one who was truly prepared by long and varied experience to lead most cheerfully, as he did, those of fewer privileges, and that our society has been deprived of the services of one of its most useful members, one whose noble character entitled him to the love and admiration of all.

"Resolved, That we tender to his family our sincerest sympathy in their great affliction; also

"Resolved, That a copy of these resolutions be sent to the family, also to the dental journals and daily papers for publication and that they be spread upon the minutes of this society."





SOCIETY ANNOUNCEMENTS

National Society Meetings.

National Association of Dental Examiners,
Minneapolis, Minn., July 26, 27, 28.

National Dental Association, Minneapolis,
Minn., July 30.

Jamestown Dental Convention, Norfolk, Va.,
Sept. 10, 11, 12.

State Society Meetings.

Alabama Dental Association, Birmingham, May 14, 15, 16, 17.

Arkansas State Dental Association, Eureka Springs, May 29, 30, 31

Colorado State Dental Society, Colorado Springs, June 20, 21, 22.

Florida State Dental Society, Atlantic Beach, June 6, 7, 8.

Georgia State Dental Society, Atlanta, May 7, 8, 9, 10.

Illinois State Dental Society, Quincy, May 14, 15, 16, 17.

Indiana State Dental Association, Indianapolis, June 11, 12, 13.

Iowa State Dental Society, Cedar Rapids, May 7, 8, 9.

Kentucky State Dental Association, Louisville, May 20, 21, 22.

Maine Dental Society, July 16.

Minnesota State Dental Association, Minneapolis, July 30, Aug. 3

Mississippi Dental Association, Meridian, May 28, 29, 30.

Nebraska State Dental Society, Lincoln, May 21, 22, 23.

New Jersey State Dental Society, Asbury Park, July 17, 18, 19.

New York State Dental Society, Albany, May 10, 11.

Oregon State Dental Association, Portland, May 9, 10, 11.

South Carolina State Dental Association, Anderson.

South Dakota Dental Society, Sioux Falls, June 4, 5, 6.

Tennessee State Dental Association, Knoxville, July 9, 10, 11.

Texas State Dental Association, San Antonio, June 13, 14, 15.

Vermont State Dental Society, Burlington, May 15.

Virginia State Dental Association, Jamestown, Sept. 10, 11, 12.

Wisconsin State Dental Society, La Crosse, July 16, 17, 18.

National Dental Association.

The eleventh annual session of this Association will be held in Minneapolis July 30, 31, and August 1, 2, when a full programme of essays, demonstrations, and clinics will be presented. Reduced rates on all railways and at hotels will be secured. The largest meeting in the history of the Association is confidently expected. A full programme will appear in July journals.

The following are the officers of the sections and chairmen of clinics and local arrangements.

SECTION I.

D. O. M. LeCron, chairman, Missouri Trust Bldg., St. Louis, Mo.
W. G. Mason, vice-chairman, Tampa, Fla.
E. P. Dameron, secretary, 58 De Menil Bldg., St. Louis, Mo.

SECTION II.

Wm. Crenshaw, chairman, 621 Prudential Bldg., Atlanta, Ga.
John I. Hart, vice-chairman, 118 W. 58th St., New York.
J. J. Sarrazin, secretary, Godchaux Bldg., New Orleans, La.

SECTION III.

Wm. Carr, 35 W. 46th Street, New York.
W. H. G. Logan, vice-chairman, 785 Winthrop Ave., Chicago, Ill.
M. L. Rhein, secretary, 38 E. 61st St., New York.

CLINICS.

E. K. Wedelstaedt, chairman, 204 N. Y. Life Bldg., St. Paul, Minn.

SECTION ON INLAYS.

Walter N. Murray, chairman, 601 Medical Blk., Minneapolis, Minn.

LOCAL ARRANGEMENTS.

F. B. Kremer, chairman, Masonic Temple, Minneapolis, Minn.

Delegates received only from State Societies, but a cordial invitation is extended to all reputable practitioners to attend the meeting.

C. S. BUTLER, Secretary,	A. H. PECK, President.
267 Elmwood Ave., Buffalo.	92 State St., Chicago.

The N. D. A. Clinic.

There is every indication that there will be a large clinic held in Minneapolis, on July 31 and August 1.

Many men have signified their intention to be present and take part



in either the operative work, or else give some kind of a table clinic. If I am to judge from what has been written me then I feel certain that we shall have a most interesting meeting, so far as the clinic is concerned.

In the past there has been some criticism regarding the clinic room being so far away from the headquarters. In no sense is the Clinic Committee to be blamed for this condition of affairs. It must take what is offered or else not have clinical demonstrations. Now, this year there is every assurance that this condition will be materially changed. Dr. F. B. Kremer, the Chairman of the Local Committee of Arrangements, is a man of much experience in dental society work, therefore, he is the very man for the place. He knows what is needed, and, beyond question, he will secure a hall for the clinic room in close proximity to the headquarters. This year, at least, those contemplating being with us need not worry about this special part of the meeting, for Dr. Kremer is a man who does not neglect anything.

From reports which are constantly being received there is every reason to believe that we shall hold a most successful clinic.

The following gentlemen are acting as District and State Chairmen:

For the New England States, Dr. G. E. Savage, Worcester, Mass.; New York, Dr. F. L. Fossume, New York; New Jersey, Delaware, and District of Columbia, Dr. M. F. Finley, Washington, D. C.; Maryland, Dr. C. N. Ginrich, Baltimore, Md.; Virginia and West Virginia, Dr. F. W. Stiff, Richmond, Va.; North and South Carolina and Georgia, Dr. H. H. Johnson, Macon, Ga.; Florida, Alabama, and Mississippi, Dr. A. T. Reeves, Selma, Ala.; Tennessee and Kentucky, Dr. W. M. Slack, Memphis, Tenn.; Pennsylvania, Dr. H. E. Friesell, Pittsburg; Ohio, Dr. H. C. Brown, Columbus; Indiana, Dr. C. D. Lucas, Indianapolis; Illinois, Dr. F. W. Gethro, Chicago; Wisconsin, Dr. S. H. Chase, Madison; Ontario, Manitoba, Dr. K. C. Campbell, Winnipeg.

It is not an easy matter to arrange the programme and I shall be grateful to all the chairmen for their list of clinicians. The earlier the list is sent the better.

New York Life Building,
St. Paul, Minn.

E. K. WEDELSTAEDT,
Chairman Clinic Section.

Texas State Dental Association.

The Texas State Dental Association will hold its meeting for this year in the city of San Antonio, June 13, 14, 15.

G. W. STAPLES, Secretary.



Jamestown Exposition, Norfolk, Virginia, 1907.
The Jamestown Dental Convention, Norfolk, Virginia, September 10-12th, 1907.

COMMITTEE ON ORGANIZATION.

Burton Lee Thorpe, Chairman, St. Louis, Mo.; H. Wood Campbell, secretary, Suffolk, Va.; F. W. Stiff, treasurer, Richmond, Va.; R. H. Walker, Norfolk, Va.; Thos. P. Hinman, Atlanta, Ga.; Clarence J. Grieves, Baltimore, Md.; J. E. Chace, Ocala, Fla.

The Jamestown Dental Convention will be held in an especially equipped building on the Exposition Grounds, which was built for the purpose of accommodating this convention. The building is equipped with an auditorium, committee rooms, and excellent facilities for conducting dental clinics and for holding exhibits. All of these will be held in this building. The entrance to the building is outside of the grounds. However, one may obtain access to the grounds through it. The building is wired with both direct and alternating current, equipped with running water, well lighted and contains all modern conveniences, thus making it an ideal convention hall. The exhibits are under the management of Dr. John W. Manning, Bank of Commerce Bldg., Norfolk, Va. To him exhibitors should apply at once for space. Price per foot and a plan of the hall will be sent upon request. The clinics are under the supervision and direct control of Dr. C. J. Grieves, Park and Madison Avenues, Baltimore, Md. His assistants are Drs. Baskerville Bridgeforth, Richmond, Va., E. J. Tucker, Roxboro, N. C., Herbert Johnson, Macon, Ga., F. A. Bowles, Washington, D. C., and Joseph T. Meadors, Nashville, Tenn. The prospects are that the Jamestown clinic will be the largest and most complete dental clinic ever held. Assistant clinic chairmen have been appointed in each State in the Union and nearby countries, viz.: Canada, Mexico, Cuba, and Hawaii. From these come reports of the enlistment of the best clinic talent in their respective states and countries. Membership chairmen have been appointed in the various states and countries. Names of these and the clinic chairmen appear with the list of other officers in this issue of this journal. The Membership Committee is headed by Dr. F. W. Stiff, the general chairman, 600 East Grace Street, Richmond, Va., who already reports memberships rapidly coming in. The hotel headquarters will be at the Inside Inn, where reasonable rates and excellent accommodations are assured. The Inside Inn generously offers numerous halls and committee rooms free of charge to the various college fra-

SOCIETY ANNOUNCEMENTS

ternities and alumni, who are invited to hold their meetings in these rooms. Later reports as to hotel headquarters and prices will appear in a subsequent issue of this journal. The membership fee is five dollars, which will entitle members to a bound copy of the proceedings. A half rate, \$2.50, is made to bona fide students upon certificates from the deans of their colleges, and when presented to the state chairman of the Membership Committee, for endorsement and acceptance, will entitle them to the rights and privileges of the convention. The essayists are to be Prof. W. D. Miller, of Berlin, Germany, Dr. F. T. Van Woert, Brooklyn, N. Y., whose subject is, "Is the Cemented Filling the Filling of the Future?" Dr. Chas. L. Alexander, of Charlotte, N. C., who will present a paper on "Gold Inlay"; and Dr. R. Ottolengui who will discuss "The Angle Method in Orthodontia," illustrated with lantern slides. Dr. E. P. Beadles was elected by the Committee on Organization, in February, to go to Europe and extend a cordial invitation to the dental societies and individual dentists to attend the convention. The following officers were elected by the committee, at its recent meeting, February 23, 1907.

Honorary President—Dr. J. Y. Crawford, Nashville, Tenn.

President—Dr. V. E. Turner, Raleigh, N. C.

First Vice-President—B. Holly Smith, Baltimore, Md.

Secretary-General—Dr. Geo. F. Keesee, Richmond, Va.

Treasurer—Dr. Mark F. Finley, Washington, D. C.

VICE-PRESIDENTS.

- | | |
|--|--|
| Dr. W. G. Mason, Tampa, Fla. | Dr. E. K. Wedlestadt, St. Paul, Minn. |
| Dr. A. C. McCurdy, Towson, Md. | Dr. A. C. Searl, Onatonna, Minn. |
| Dr. Edward Eggleston, Richmond, Va. | Dr. T. M. Hampton, Helena, Mont. |
| Dr. D. N. Rust, Washington, D. C. | Dr. Geo. Longway, Great Falls, Mont. |
| Dr. Geo. W. Boynton, Washington, D. C. | Dr. H. F. King, Fremont, N. H. |
| Dr. J. R. Osborne, Shelby, N. C. | Dr. Ed. C. Blaisdell, Portsmouth, N. H. |
| Dr. S. H. Johns, Wilmington, Del. | Dr. Chas. A. Meeker, Newark, N. J. |
| Dr. Max M. Eble, Louisville, Ky. | Dr. R. M. Sanger, Orange, N. J. |
| Dr. Chas. L. Gunn, Gadsden, Ala. | Dr. H. J. Burkhart, Batavia, N. Y. |
| Dr. R. W. Quarles, Van Buren, Ark. | Dr. R. Ottolengui, New York, N. Y. |
| Dr. Wm. Crenshaw, Atlanta, Ga. | Dr. Wm. Carr, New York, N. Y. |
| Dr. S. F. Kemp, Key West, Fla. | Dr. Geo. H. Wilson, Cleveland, Ohio. |
| Dr. A. A. McClanahan, Springfield, Tenn. | Dr. L. C. Custer, Dayton, Ohio. |
| Dr. J. H. E. Milhous, Blackville, S. C. | Dr. Norris R. Cox, Portland, Ore. |
| Dr. L. B. McLaurin, Mississippi, La. | Dr. Arthur W. Chance, Portland, Ore. |
| Dr. F. A. Blanchard, Marksville, La. | Dr. Edward C. Kirk, Philadelphia, Pa. |
| Dr. R. D. Griffiths, Paris, Texas. | Dr. Wilber F. Litch, Philadelphia, Pa. |
| Dr. J. D. Patterson, Kansas City, Mo. | Dr. Edwin T. Darby, Philadelphia, Pa. |
| Dr. O. M. LeCron, St. Louis, Mo. | Dr. H. C. Register, Philadelphia, Pa. |
| Dr. J. A. Hall, Collinsville, Ala. | Dr. T. T. Moore, Columbia, S. C. |
| Dr. T. M. Milam, Little Rock, Ark. | Dr. T. T. McClanahan, Nashville, Tenn. |
| Dr. W. E. Norris, Charlottesville, Va. | Dr. L. G. Noel, Nashville, Tenn. |
| Dr. Wm. M. Bebb, Los Angeles, Cal. | Dr. Pitt S. Turner, Belton, Texas. |
| Dr. Garrett Newkirk, Pasadena, Cal. | Dr. John W. David, Corsicana, Texas. |
| Dr. James McManus, Hartford, Conn. | Dr. W. Leon Ellerbeck, Salt Lake City, Utah. |
| Dr. W. W. Evans, Washington, D. C. | |

ITEMS OF INTEREST

Dr. L. C. Elkins, St. Augustine, Fla.
 Dr. H. H. Johnson, Macon, Ga.
 Dr. G. Edwin Hunt, Indianapolis, Ind.
 Dr. G. V. Black, Chicago, Ill.
 Dr. T. W. Brophy, Chicago, Ill.
 Dr. A. H. Peck, Chicago, Ill.
 Dr. C. M. Work, Ottumwa, Kan.
 Dr. Alton H. Thompson, Topeka, Kan.
 Dr. J. E. Woodward, New Orleans, La.
 Dr. R. R. Andrews, Cambridge, Mass.
 Dr. W. E. Barden, Boston, Mass.
 Dr. Geo. L. Field, Detroit, Mich.

Dr. W. G. Dalrymple, Ogden, Utah.
 Dr. Chas. F. Irwin, Vancouver, Wash.
 Dr. G. V. I. Brown, Milwaukee, Wis.
 Dr. W. A. Cudworth, Milwaukee, Wis.
 Dr. A. J. Derby, Hawaii, Honolulu.
 Dr. Andres C. Weber, Havana, Cuba,
 Corelas, 1 Esq. Egido.
 Dr. J. Falero, 18 Tacuba, City of Mex-
 ico, Mexico.
 Dr. Ricardo Figueroa, 1 Calle de Santo
 Domingo, No. 8, City of Mexico,
 Mex.

GENERAL CLINIC COMMITTEE

Clarence J. Gieves, chairman, Park and
 Madison Aves., Baltimore, Md.
 Baskerville Bridgeforth, Richmond, Va.
 E. J. Tucker, Roxboro, N. C.

H. Herbert Johnson, Macon, Ga.
 F. A. Bowles, Washington, D. C.
 Joseph T. Meadors, 625 1-2 Church St.,
 Nashville, Tenn.

STATE CHAIRMEN OF CLINICS.

Alabama—L. A. Crumley, Hood Bldg.,
 Birmingham.
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 ville.
 California—Frank L. Platt, 712 Steiner
 St., San Francisco.
 Connecticut—Chas. McManus, 80 Pratt
 St., Hartford.
 Colorado—W. E. Sinton, El Paso Bldg.,
 Colorado Springs.
 Delaware—C. R. Jeffris, New Century
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 Dist. of Columbia—H. J. Allen, 303-4
 Colorado Bldg., Washington.
 Florida—Carroll H. Frink, Fernandina.
 Georgia—A. M. Jackson, Macon.
 Idaho—J. B. Burns, Payette.
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 McAllister.
 Indiana—Carl D. Lucas, Willoughby
 Bldg., Indianapolis.
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 Kansas—Frank O. Hetrick, Ottawa.
 Kentucky—E. D. Rose, Bowling Green.
 Louisiana—Jules J. Sarrizan, New Or-
 leans.
 Maine—H. A. Kelley, 609 Congress St.,
 Portland.
 Maryland—George E. Hardy, Baltimore.
 Michigan—E. B. Spaulding, 4 Adams
 Ave., West Detroit.
 Massachusetts—C. W. Rodgers, Dor-
 chester.
 Minnesota—J. W. S. Gallagher, Winona.
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 Montana—G. E. Longway, Great Falls.
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 brook Place, Newark, N. J.
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 North Dakota—C. L. Rose, Fargo.
 Ohio—H. C. Brown, 185 E. State St.,
 Columbus.
 Oklahoma—Theodore P. Bringhurst,
 Shawnee.
 Oregon—Arthur W. Chance, DeKum
 Bldg., Portland.
 Pennsylvania—H. B. McFadden, 3505
 Hamilton Ave., Philadelphia.
 Rhode Island—Dennis F. Keefe, 315 But-
 ler Exchange, Providence.
 South Carolina—Thomas T. Moore, Jr.,
 Columbia.
 South Dakota—E. S. O'Neil, Canton.
 Tennessee—A. J. Cottrel, Knoxville.
 Texas—John W. David, Corsicana.
 Utah—William Leon Ellerbeck, 21 Hoo-
 per Bldg., Salt Lake City.
 Vermont—E. O. Blanchard, Randolph.
 Virginia—R. L. Simpson, Richmond.
 Washington—C. A. Custer, Chapin
 Block, Seattle.
 West Virginia—F. L. Wright, Wheeling.
 Wisconsin—W. A. Cudworth, Milwau-
 kee.
 Mexico—J. Falero, 18 Tacuba, City of
 Mexico.
 Cuba—Andres G. Weber, Corelas 1 Esq
 Egido, Havana.
 Hawaii—A. J. Derby, Honolulu.



GENERAL MEMBERSHIP COMMITTEE.

F. W. Stiff, chairman, 600 East Grace
St., Richmond.
A. S. Melindy, Knoxville, Tenn.

William Crenshaw, Atlanta, Ga.
M. S. Merchant, Mason Bldg., Houston,
Texas.

STATE CHAIRMEN FOR MEMBERSHIP.

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Little Rock.
California—J. Lorenz Pease, Oakland.
Connecticut—Frederic T. Murless, Jr.,
Windsor Locks.
Colorado—Henry F. Hoofman, 612 Cali-
fornia Bldg., Denver.
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Florida—F. E. Buck, Jacksonville.
Georgia—Walter G. Miller, Augusta.
Idaho—J. H. Lewis, Nez Perce.
Illinois—Frederick B. Noyes, Stewart
Bldg., Chicago.
Indiana—Frederick R. Henshaw, Mid-
dletown.
Indian Territory—J. M. Staples, Atoka.
Iowa—F. T. Breene, Iowa City.
Kansas—F. C. Corey, Council Grove.
Kentucky—A. B. Dixon, Glasgow.
Louisiana—G. Victor Vinges, Macheca
Bldg., New Orleans.
Maine—Will S. Payson, Castine.
Maryland—W. G. Foster, 9 West Frank-
lin Street, Baltimore.
Massachusetts—Waldo E. Boardman, 419
Boyleston Street, Boston.
Michigan—Albert L. Le Gro, 271 Wood-
ward Ave., Detroit.
Minnesota—James Elmer Weirick, St.
Paul.
Missouri—D. O. M. LeCron, Mo. Trust
Bldg., St. Louis.

Mississippi—A. E. Tillman, Vicksburg.
Montana—T. M. Hampton, Helena.
New Jersey—Alphonse Irwin, Camden.
Nebraska—E. H. Bruening, Omaha.
New Hampshire—H. P. Baldwin, Man-
chester.
New York—H. Clay Ferris, 1166 Dean
St., Brooklyn.
North Carolina—C. A. Bland, Charlotte.
Ohio—L. P. Bethel, Columbus.
Oklahoma—G. L. White, Oklahoma City.
Oregon—George H. Nottage, Portland.
Pennsylvania—Howard E. Roberts, 1517
Locust St., Philadelphia.
Rhode Island—Albert L. Midgley, 312
Butler Exchange, Providence.
South Carolina—L. P. Dotterer, Charles-
ton.
South Dakota—C. S. Collins, Vermillion.
Tennessee—Justin D. Towner, Memphis.
Texas—Rufus W. Carroll, Beaumont.
Utah—W. G. Dalrymple, Ogden.
Vermont—K. L. Cleaves, Montpelier.
Virginia—Wm. Pilcher, Petersburg.
Washington—F. J. Shaw, Burke Block,
Seattle.
Wisconsin—W. H. Mueller, Madison.
Mexico—Ricardo Figueroa, 1 Calle de
Santo Domingo, No. 8, City of
Mexico.
Canada—Theodore C. Trigger, St.
Thomas, Ontario.
Hawaii—E. L. Hutchinson, Honolulu.
West Virginia—Chas. H. Bartlett, Par-
kersburg.

Michigan State Dental Association.

The annual meeting of the Michigan State Dental Association will
be held in Saginaw, June 4 and 5. All ethical practitioners are cordially
invited to attend.

L. N. HOGARTH, Secretary.

Kentucky State Board of Dental Examiners.

The Kentucky State Board of Dental Examiners will meet for the examination of applicants at Louisville, on the fourth of June, 1907, at The Masonic, commencing at nine o'clock.

Each applicant for examination shall be required to deposit with the Secretary of the Board his or her recent photograph, with signature on the reverse side, both of which shall be certified to by the Dean of his or her graduating college, or other parties acceptable to the Board. Applicants must be graduates of reputable dental colleges.

Applicants shall be examined in the following subjects: Anatomy, Physiology, Materia Medica, Pathology, Histology, Operative Dentistry, Oral Surgery, Chemistry, Metallurgy, Prosthetic Dentistry, Crown and Bridge Work and Dental Prophylaxis.

Every applicant shall be required to treat two or more teeth affected with pyorrhea; to insert two gold fillings; two amalgam fillings; impression, bite and articulating teeth of upper and lower denture; one bridge on model, consisting of one shell and one Richmond crown and two porcelain faced dummies; one gold or porcelain inlay or Logan crown, one practical case diagnosis; all to be done before the Board.

A general average of 75 per cent. is required. Applicants will be graded upon a basis of 60 per cent. on practical work and 40 per cent. on theory.

Applicants must come prepared with instruments, engine and material, excepting bellows, blow-pipe, lathe, stones, and polishing cones, to do the above-mentioned work.

The Board would advise the use of gold in the above bridge, as it would cost very little more than German silver after disposing of the bridge.

Application for examination must be made upon blanks furnished by the Board and must be accompanied by a fee of \$20.00.

J. RICHARD WOLLEN, President.

The Masonic, Louisville, Ky.

Illinois State Board of Dental Examiners.

The next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois will be held in Chicago, at the Northwestern Uni-

versity Dental School, southeast corner of Lake and Dearborn Streets, beginning Monday, June 3, 1907, at 9 A. M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty (\$20) dollars with the additional fee of five (\$5) dollars for a license. Address all communications to

J. G. REID, D.D.S., Secretary.

1204 Trude Bldg., 67 Wabash Ave., Chicago, Ill.

Vermont State Board of Dental Examiners.

A meeting of the Vermont State Board of Dental Examiners, for the examination of candidates, will be held at the State House, Montpelier, Vt., Monday, Tuesday, and Wednesday, July 1, 2, and 3, 1907, commencing at 2 o'clock of July 1. All applications, together with the fee, \$25.00, must be in the hands of the Secretary not later than June 23. Application blanks and further information may be obtained from

GEO. F. CHENEY, Secretary.

St. Johnsbury, Vt.

The Kansas State Board of Dental Examiners.

The Kansas State Board of Dental Examiners will hold their next meeting for examination in Topeka, May 22, 23, 24, 25, 1907, at the Cope-land Hotel annex.

The examination fee is \$25.00 and an additional fee of \$5.00 for a license.



Examination is not necessary for a graduate of a reputable dental college. The fee for registering a diploma is \$25.00.

Address all communications to

F. O. HETRICK, Secretary.

Ottawa, Kansas.

Connecticut Dental Commissioners.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday, and Saturday, June 13, 14, and 15, 1907, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

All applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and, with fee, filed with the recorder on or before June 6, 1907. By order of commission.

GILBERT M. GRISWOLD, Recorder.

783 Main Street, Hartford, Conn.

West Virginia State Board of Dental Examiners.

The West Virginia State Board of Dental Examiners will hold their next meeting for the examination of candidates at Wheeling, West Virginia, June 12, 13, 14, 1907. For further information address

H. M. VAN VOORHIS, Secretary.

Morgantown, W. Va.

Texas Board of Dental Examiners.

The Texas State Board of Dental Examiners will hold their next annual meeting at San Antonio, Texas, June 10, 1907, at 10 A. M. For further information address

C. C. WEAVER, Secretary.

Hillsboro, Texas.



Tennessee Dental Association.

The fortieth annual meeting of the Tennessee Dental Association will be held at Knoxville, July 9, 10, 11, 1907. A splendid programme is being arranged by the Executive Committee, and a most cordial welcome extended to all.

R. J. McGAWCK, Cor. Secretary.

Columbia, Tenn.

Odontotechnique Society of New Jersey.

The May meeting of the Odontotechnique Society of New Jersey will be held at Achtel Stetter's, Newark, on Saturday Evening, May 4. The paper of the evening will be read by D. A. Webb, M.D., of Scranton, Pa., president of the Scranton Clinical and Pathological Society. Subject: "Diseases of the Jaws; Malignant Growths, Fractures, etc."

H. J. GIBBINS.

Iowa State Dental Society.

The forty-fifth annual meeting of the Iowa State Dental Society, will be held at Cedar Rapids, Iowa, May 7, 8, 9, 1907. A good programme is being arranged. A cordial invitation is extended to the profession.

T. L. TOPLIFF, Secretary.

Decorah, Iowa.

Iowa State Board of Dental Examiners.

The Iowa State Board of Dental Examiners will hold its next meeting for examination at Iowa City, June 6, 7, 8, 10, 11, 1907.

To be eligible to this examination the applicant must hold a diploma from a college that is on the accredited list of the National Association of Dental Examiners.

Applicant must state where he attended first, second, and third year of college. Address all communications to

E. D. BROWER, D.D.S., Secretary.

Le Mars, Iowa.



New Hampshire Board of Registration in Dentistry.

The New Hampshire Board of Registration in Dentistry will hold its next examination of applicants for registration in Manchester, N. H., June 11, 13, 1907.

A. J. SAWYER, Secretary.

Manchester, N. H.

South Carolina State Board of Dental Examiners.

The South Carolina State Board of Dental Examiners will meet in annual session at Anderson, S. C., on June 28, 1907, to examine applicants for license.

For further information address

BROOKS RUTLEDGE, Secretary.

Florence, S. C.

Colorado State Dental Society.

The annual meeting of the Colorado State Dental Society will be held at Colorado Springs, June 20, 21, 22, 1907.

A good programme is being arranged and a profitable meeting is assured.

An invitation to attend is extended to all ethical dentists, and special efforts will be put forth to make it pleasant for visitors from other states.

The undersigned would be pleased to hear from any who may plan to attend the meeting.

I. C. BROWNLIE,

Chairman of Executive Committee.

404 California Bldg.,
Denver, Colo.

Florida State Dental Society.

The Florida State Dental Society will hold its twenty-fourth annual meeting in the Continental Hotel, at Atlantic Beach, Thursday, June 6, continuing in session three days. All ethical practitioners are cordially invited to attend.

C. H. FRINK, Cor. Secretary.



Florida State Board of Dental Examiners.

The Florida State Board of Dental Examiners will meet June 3, 1907, at 10 o'clock, in Jacksonville, Fla., for the purpose of examining applicants for license to practice in this State.

In addition to the written examination, applicants will be required to put in one gold filling, one alloy filling, and solder and finish one four-tooth bridge under supervision of Board.

Bring bridge ready for investing. Only graduates of reputable dental schools are admitted to examination.

W. G. MASON, D.D.S., Secretary.

Tampa, Fla.

South Dakota Dental Society.

The twenty-fifth annual meeting of the South Dakota Dental Society, will be held in Sioux Falls, June 4, 5, 6.

A most interesting programme has been arranged and we want to see the largest attendance the society has ever had. A larger membership is desired, and every dentist in the State who is eligible should become a member.

A special invitation is extended to southeastern Minnesota and northwestern Iowa dentists to attend.

FERDINAND BROWN, Secretary.

Sioux Falls.

Alumni Society of the Philadelphia Dental College.

The Alumni Society of the P. D. C., will celebrate Alumni Day, Friday, May 31, 1907, in the college buildings at 18th and Buttonwood Streets, Philadelphia, Pa. All those dentists interested in this college are cordially invited to be present.

CLINICS.

At 10 A. M., in the morning, a series of Clinics will be given under the auspices of the Clinic Committee, composed of Dr. C. R. Jeffries, chairman, Drs. Max Greenbaum and W. G. Chase.



BUSINESS MEETING.

At 2:30 P. M. the business meeting of the society will be held in the amphitheater of the college, when Dr. Wm. T. Wyckof will deliver the presidential address. Dr. L. A. O'Brian, of New York City, will read the annual paper. After the discussion of this paper has taken place, the faculty will have some very interesting dental subjects to present, as well as some college announcements to make of vital importance to the Alumni.

THE ALUMNI BANQUET.

The annual banquet will take place Friday evening, May 31. An announcement of the time, place, and cost per cover will be made later on. The Banquet Committee, consisting of Dr. W. G. Chase, chairman, Drs. M. F. Quinn and H. Iredell, have full charge and application for seats should be made to them. The trustees, faculty, students, graduating class and alumni will be warmly welcomed at this banquet which will be enlivened by the wit and eloquence of famous speakers.

An unusual feature which will characterize Alumni Day for 1907, is the fact that it will be the last to be held under the old regime. This year the Philadelphia Dental College will enter into a federation with Temple College. There will be an entirely new board of trustees with Dr. Russell H. Conwell as president. Dr. Leo Greenbaum continues as dean, and the faculty remain the same.

ALPHONSO IRWIN, D.D.S., Secretary.

University of Pennsylvania Dental Department, Class of 1902.

The fifth annual reunion of the Class of 1902, Dental Department of the University of Pennsylvania, will be held on Alumni Day, Saturday, June 15, 1907.

All are earnestly requested to make an effort to come back to their Alma Mater on that day.

J. ARTHUR STANDEN, Secretary.

1220 Locust Street, Philadelphia, Pa.